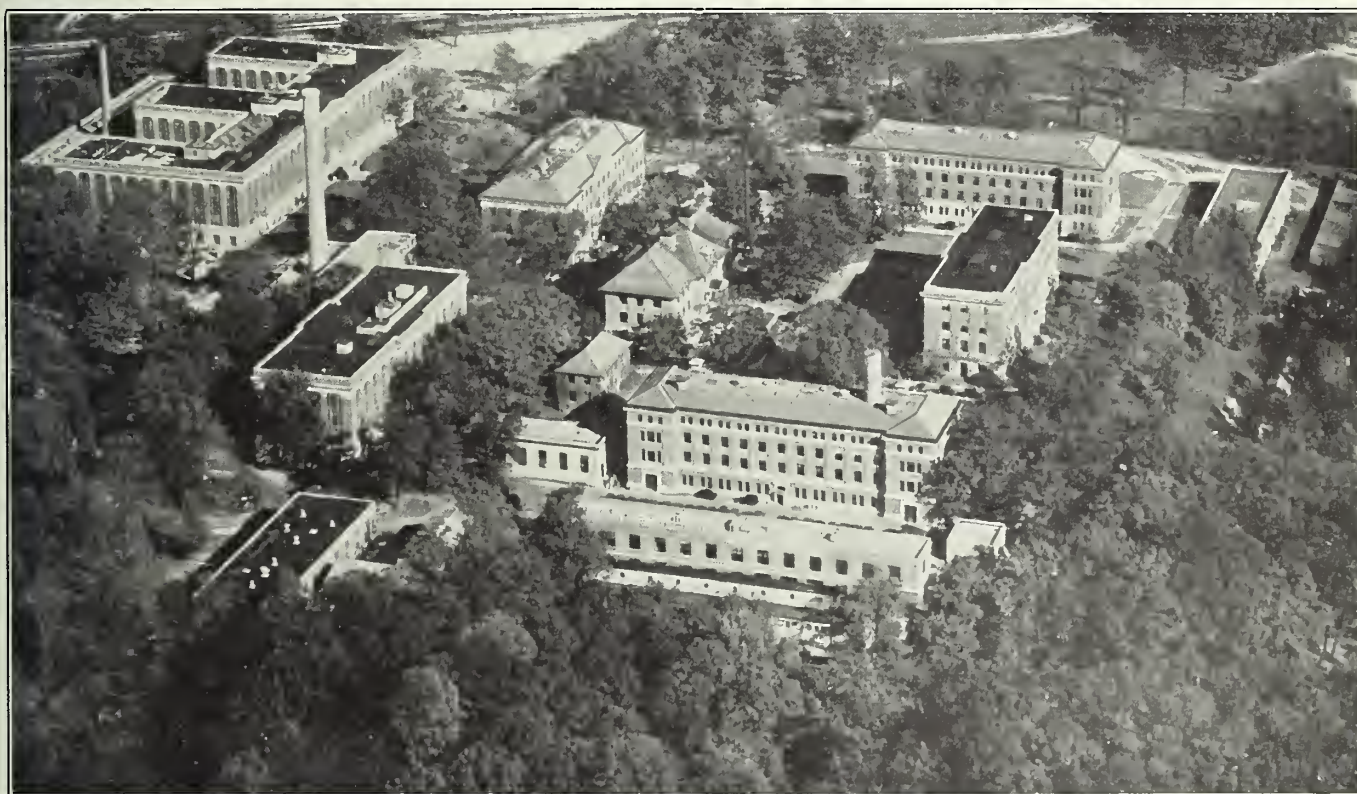


# COMMERCIAL STANDARDS MONTHLY



*A Review of Progress in  
Commercial Standardization and Simplification*



AIRPLANE VIEW OF NATIONAL BUREAU OF STANDARDS

ISSUED BY THE NATIONAL BUREAU OF STANDARDS OF THE  
UNITED STATES DEPARTMENT OF COMMERCE, WASHINGTON, D.C., U.S.A.

Vol. 6, No. 7



JANUARY, 1930



# U. S. DEPARTMENT OF COMMERCE

R. P. LAMONT, Secretary

## NATIONAL BUREAU OF STANDARDS

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Assistant Director for  
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COMMERCIAL STANDARDS MONTHLY  
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### DIVISIONS OF THE COMMERCIAL STANDARDIZATION GROUP

#### DIVISION OF SIMPLIFIED PRACTICE, EDWIN W. ELY.

The division of simplified practice was formed in November, 1921, to provide a clearing house or centralizing agency through which the manufacturer, distributor, and consumer groups could meet to discuss their common problems and decide upon eliminations which would prove of mutual benefit to all concerned. The activities of the division are purely cooperative in character. It orders nothing; it dictates nothing; the initiative must come from business itself. It has no regulatory nor police powers to enforce adherence to the simplified-practice recommendations that industry develops under the auspices of the United States Department of Commerce. Its chief function is to serve as a neutral meeting ground for the purpose of bringing together producers, distributors, and consumers, whose aims are sometimes divergent and possibly antagonistic, and who would be unwilling to cooperate, except through some unbiased central agency. Following the approval of the tentative simplified-practice recommendation by a general conference of all interested elements thereof, the project is then presented to the entire industry by letter referendum for its approval and written acceptance, the publication and indorsement of the recommendation on the part of the Department of Commerce being dependent upon acceptance of the program by at least 80 per cent, by volume, of the manufacturers, distributors, and users concerned.

#### AMERICAN MARINE STANDARDS COM'TEE, A. V. BOUILLON.

The American Marine Standards Committee was organized to promote simplification of practice and elimination of waste in the marine and allied industries. It is composed of individuals, corporations, societies, Government departments, public bodies, or other organizations or groups engaged in building or operating ships, port facilities, and related activities. It works in close cooperation with official agencies, but its activities are controlled by an executive board elected annually by and from the membership. For further information, write direct to the secretary, A. V. Bouillon, Room 713, Department of Commerce, Washington, D. C.

#### DIVISION OF TRADE STANDARDS, I. J. FAIRCHILD.

The commercial standards unit, now known as division of trade standards, was created on October 1, 1927, for the purpose of aiding those industrial and commercial groups desiring to establish standards of grades, quality, or measurements for their products or their purchases on a purely voluntary basis.

The division functions only at the direct request of the industry concerned. Its procedure is similar to that of the division of simplified practice, except that at least 65 per cent of the industry, by volume of annual production, must accept the commercial standard in writing before it is published by the Department of Commerce. A certification plan is applied

#### DIVISION OF TRADE STANDARDS—Continued.

on request as a means of increasing the effectiveness of such standards. Provision is made for regular revision of the standard through the appointment of a standing committee to consider periodically any necessity for revision of the standard, in order that it may be kept constantly compatible with progress in the industry.

#### DIVISION OF SPECIFICATIONS, A. S. McALLISTER.

The duties of the division of specifications are to promote and facilitate the use and unification of specifications. In doing so it carries on activities involving cooperation with technical societies; trade associations; Federal, State, and municipal Government specifications making and using agencies; producers, distributors, and consumers; and testing and research laboratories. The cooperation with technical societies and trade associations includes ascertaining the standardization and specification promoting activities of these organizations, and bringing to their attention the work being done by the commercial standardization group. The cooperation with producers involves the compilation of lists of manufacturers who have expressed their willingness to certify to purchasers, upon request, that material supplied by them on contracts based on certain Federal specifications or commercial standards comply with the requirements thereof. The division prepares the directories of governmental and nongovernmental testing laboratories; the Directory of Specifications; and is working on an encyclopedia of specifications, the first volume of which, Standards and Specifications in the Wood-Using Industries, has been issued. It also aids in preparing the Standards Year-book.

#### BUILDING AND HOUSING DIVISION, J. S. TAYLOR.

The division of building and housing cooperates with business, technical, and professional groups in practically all its undertakings on building and housing. Its work to modernize building codes and to encourage improved standards for the quality of building construction promotes the practical application of the latest development in design and use of building materials. This division was also formed in 1921.

In furthering home ownership, an effort is made to develop an enlarged, steadier, more intelligent, and more discriminating demand for soundly built dwellings, the largest single class of buildings which the construction industries provide. The division also cooperates with many business and professional groups in efforts to distribute building activity more evenly throughout the year, and to secure less fluctuation from year to year. The work on city planning and zoning has in mind the broad objective of buildings made more useful because well located with respect to other buildings, a well-coordinated street system, and appropriate public works. Good city planning and zoning likewise encourages stability in land values and property uses, and thereby contributes to the demand for durable structures.

Except where otherwise indicated, for further information address

**BUREAU OF STANDARDS**

WASHINGTON, D. C.

# COMMERCIAL STANDARDS MONTHLY

## *A Review of Progress in Commercial Standardization and Simplification*

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### AN INVITATION TO VISIT THE BUREAU OF STANDARDS

An interesting fact in the growth of the bureau is the steady increase in the number of visitors. From all over the world experts come to see the work in progress in many specialties. Not alone the experts but in growing numbers many of our people visit the bureau from a public-spirited desire to acquaint themselves with its research work. All visitors, from the newspapermen, who have called the bureau a "house of wonders," to the specialists, who use its services, are welcome, for it is their bureau in a very real sense. They are the owners of the business and its beneficiaries. The annual per capita cost of 2 cents which the average citizen pays toward the operation of the bureau yields returns sometimes a hundredfold or a thousandfold. How science turns wastes into profits, increases the useful life of materials, adds new efficiencies to industry, advances new arts, such as aviation and radio, by research and discovery—these are to be seen first hand in the scientific and technical laboratories of the bureau.

A cordial invitation is extended to all citizens interested in scientific progress to visit the laboratories of the Bureau of Standards when in Washington. A personally conducted trip is organized at 2.15 p. m. daily except on holidays. Special trips for groups may be arranged at other times by writing to the bureau in advance. The bureau's illustrated Visitor's Manual may be had for the asking. This lists the work in progress and gives an airplane view of the ensemble and a brief statement of typical discoveries and inventions which have been notable, basic contributions to radio, aviation, and other modern arts and industries.

GEORGE K. BURGESS, *Director.*



# RAY M. HUDSON

## ACCEPTS POST WITH NEW ENGLAND COUNCIL



RAY M. HUDSON, Assistant Director of the Bureau of Standards, in charge of commercial standards, tendered his resignation to the Director, effective December 31, 1929, to become associated with the New England Council, as secretary of the Massachusetts division with headquarters in Boston. Ever since his graduation from Syracuse University in 1908, he has devoted his best efforts to the study of simplification, standardization, and scientific management methods, and to-day is recognized nationally as an authority on the elimination of industrial waste. He has been a frequent contributor to technical, trade, and business magazines, and has prepared the section on simplification and standardization for two successive editions of the Encyclopedia Britannica.

Before being called by President Hoover, then Secretary of Commerce, as technical assistant in the division of simplified practice, he was associated for several years with Col. George D. Babcock, a member of the Hoover Committee on Waste in Industry, in the installation of scientific management methods in the plants of the H. H. Franklin Manufacturing Co., Syracuse, N. Y., and of the Holt Manufacturing Co., Peoria, Ill.

During the World War he served with the Emergency Fleet Corporation, as a production engineer in the procurement of machinery. In 1923, Hudson was made assistant chief of the division of simplified practice, and in 1925, its chief. With the creation, in September of 1927, of the commercial standardization group within the Bureau of Standards, he became an Assistant Director of the Bureau, in charge of this work. During the time he has been associated with the Department of Commerce, 117 simplified practice recommendations, 18 commercial standards, and more than 60 marine standards have been developed by their respective industries.

Hudson is a member of the Taylor Society, the Society of Automotive Engineers, Committee on Uniform Traffic Regulations of the National Street and Highway Conference, Committee on "Expense of Doing Business" of the National Distribution Conference, Committee on Research of the American Engineering Council, Committee on Waste Elimination of the Society of Industrial Engineers, the National Research Council's Committee on Industrial Lighting, the National Committee on Wood Utilization, and others. For two years, 1926 and 1927, he served as secretary of the National Management Week Committee, directing management work meetings in nearly 100 cities.

# IRON AND STEEL PRODUCTS TESTED TO INSURE SAFETY IN CONSTRUCTION

Bureau of Standards Conducts Research on Improvements and Economics in Structural Materials

By H. L. WHITTEMORE, *Bureau of Standards*

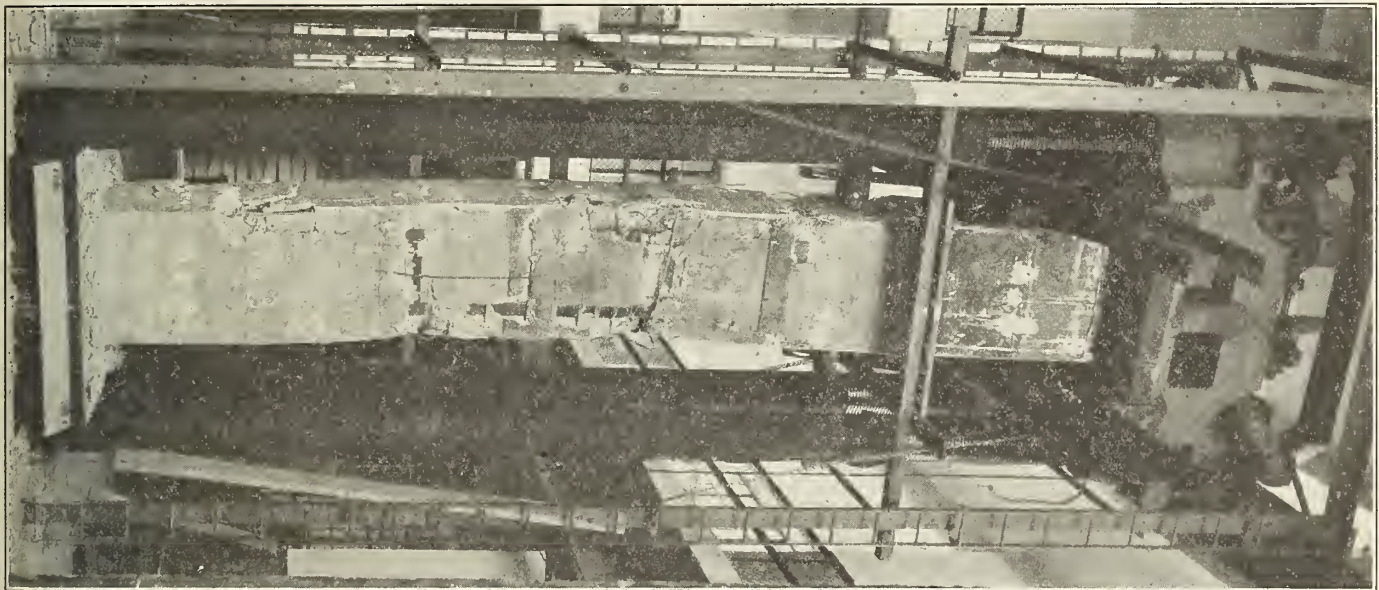
The work of the engineering mechanics section of the Bureau of Standards is to determine the mechanical properties of engineering materials. Most of the problems are on fabricated metals, such as structures or machines. Considerable attention is given to the design and calibration of testing machines to insure correct values of the forces and to the instruments used in measuring the deformation of the specimens.

Tests are also made to determine the results obtained by new processes, such as welding, which is rapidly replacing riveting in the fabrication of steel structures. The results from this work give proof of the steady advance in engineering technology. Typical examples of investigations in these fields have

the cross-sectional area of the tower section. Some of the specimens were made from low-carbon steel, some from silicon steel, and some from manganese steel. Several of these were incased in reinforced concrete and then tested so as to determine the increase in the specimen's strength due to the concrete.

## Pad eyes for submarines.

The Navy Department in developing methods of salvaging submarines wished to know the strength of pad eyes which can be attached to the hull of the submarine, when it is built, and used in an emergency for lifting it to the surface. The Bureau of Construction and Repair of the Navy Department made a full-size



*Incased carbon steel column loaded on both concrete and steel after test*

been selected to illustrate the work being done in our laboratory and its value to the people of this country.

## Bridge towers.

At the present time the Port of New York Authority is constructing a new suspension bridge across the Hudson River between upper Manhattan, New York City, and Fort Lee, N. J. This bridge has a span of 3,500 feet, which is double that of any bridge previously built.

This being the case, it is desirable that certain features of the design be tested to confirm the results of design computations. These results will, undoubtedly, be of great value to engineers and aid them in designing large bridges. Scale models of the tower sections of the Hudson River Bridge have been tested as columns in the 10,000,000-pound capacity compression testing machine here in our laboratory. The specimens were 24 feet long and approximately one-fourth

specimen, having two pad eyes riveted to a portion of a submarine hull, and submitted it for test.

The strength of the pad eyes was determined by pulling in the large Emery hydraulic testing machine, having a capacity of 1,150,000 pounds in tension. The results proved the strength of the pad eyes. There are obvious advantages in testing a new device such as this in the laboratory so that failure will not occur when rescue work is in progress and human lives are at stake.

## Locking screw threads.

Ordinarily, little investigational work is done on the less important parts of a structure. For years inventors have attempted to construct threaded pieces, such as bolts and nuts, so that they would not unscrew under service conditions. Use of these devices, as on a locomotive, was the only way to determine whether or not they fulfilled their purpose.

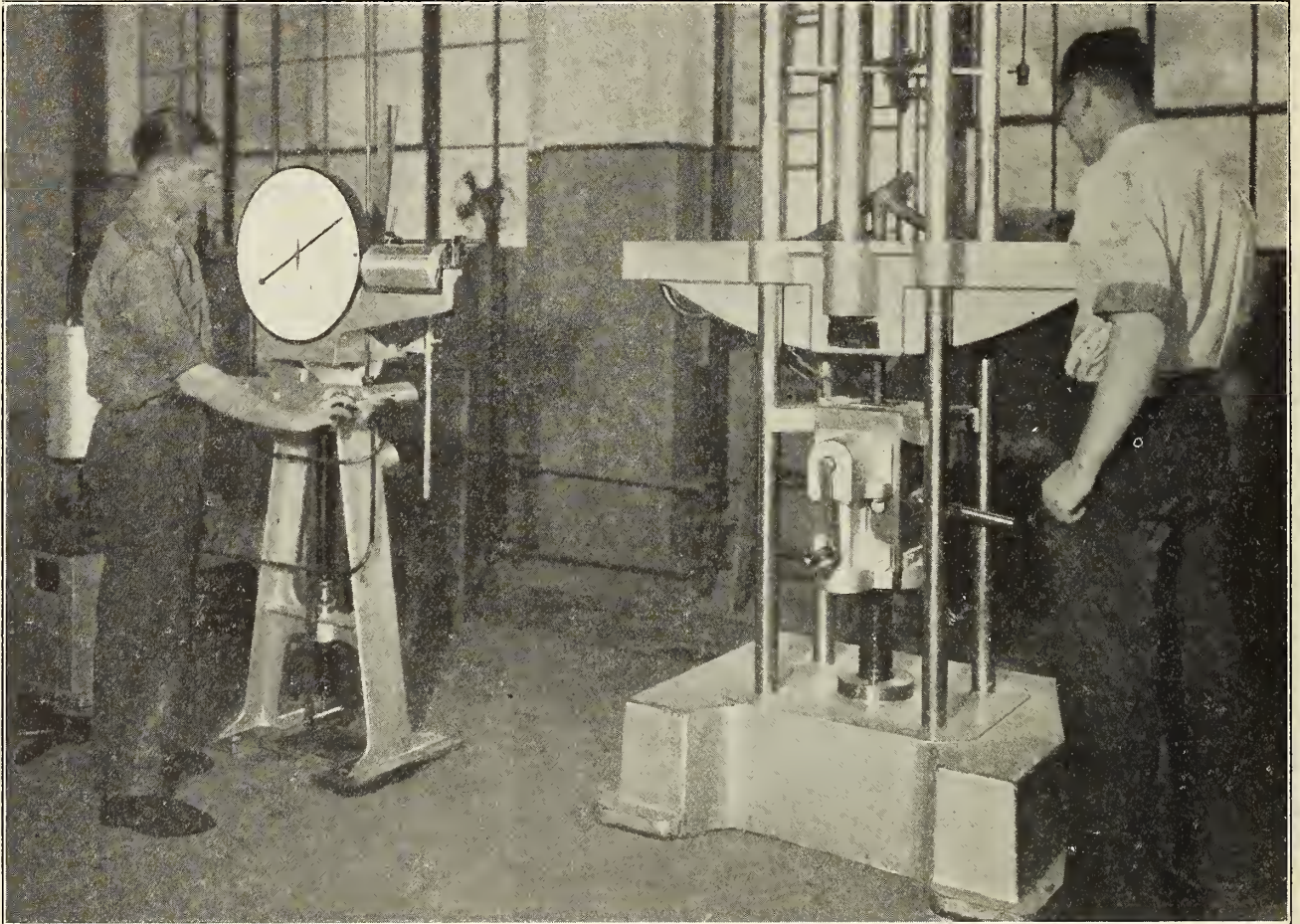


For the past two years, however, a laboratory investigation has been under way in cooperation with the Dardet Threadlock Corporation, of all kinds of locking devices for screw threads. As no thorough investigation of this important engineering problem has been made up to the present time, a large amount of study and experimental work has been necessary in order to devise tests which will stimulate service conditions. Machines have been designed and are being built for this work. The results of the investigation will be published and should throw much needed light on this very obscure problem.

welded. It was found that tubing made in this way has practically the same appearance as seamless tubing, and that the strength and other properties of the tubing depend only on the properties of the base metal, not upon the properties of the weld. The report on this investigation will soon be published by the Bureau of Standards.

#### **Welded joints for aircraft.**

There is no doubt in anyone's mind as to the growing popularity of the most modern means of transportation, the airplane. Congress has established in



*Strength of welded joints in tubular members for aircraft; lattice joint in testing machine*

#### **Welded steel tubing.**

Steel tubing has been used extensively in aircraft, and is now being considered for other structures. The reason for this is that the weight of structures, in many cases, can be materially decreased if tubes are used instead of the usually rolled shapes, channels or I sections, for instance. The drawing process is tedious and expensive, and it is difficult to obtain a uniform wall thickness; therefore, the cost of tubes is high compared to rolled shapes.

An investigation of the strength and other properties of welded steel tubing has been made in cooperation with Steel & Tubes (Inc.) during the last two years. This tubing is made from sheet steel formed into a tube and the longitudinal seam electrically

the Department of Commerce an aeronautics branch to regulate aircraft and issue certificates for approved types of airplanes.

An investigation of the strength of the welded joints in the tubular framework of airplanes are now being carried out in cooperation with the aeronautics branch of the department. It will include all types of welded joints used at the present time and other types in order to develop if possible, greater strength or other advantages. Special testing fixtures had to be designed to test these joints under conditions similar to those found in service.

Manufacturers, as well as Government departments, should find the results of great value.



## RESULTS AND BENEFITS OF APPLYING SIMPLIFIED PRACTICE TO GRINDING WHEELS

**Through Development of Simplified Practice Recommendation, Variety of This Commodity Reduced 64 Per Cent; Manufacturers, Distributors, and Users Express Their Opinion of Value of Recommendation**

J. F. McNEIL, *Division of Simplified Practice*

The annual addition of hundreds of new shapes, sizes, and types of grinding wheels to the already overdiversified line, prompted the industry in 1925 to enlist the services of the division of simplified practice in an effort to reduce the then existing variety.

A pamphlet issued in 1916 contained the details of an effort, which was initiated some 14 years ago, toward simplification and standardization in this industry. The scant recognition it received may have been due to a lack of recognition by a part of the industry of the potential value of such work. In 1920, however, the industry appointed a committee for the purpose of revising and extending the work previously done, so as to formulate acceptable standards of grinding wheels.

The necessity for reviving this project was emphasized by the confusion which prevailed in the plants of the manufacturers. Rapid development in the use of grinding machines had opened new markets for grinding wheels, and this expansion had been so swift that little opportunity had been afforded the machine designer and the fabricator of grinding wheels to cooperate in the formulation of standard dimensions and styles.

### Research made of past records.

Five years of research and careful study of the manufacturers production and sales records by the simplified practice committee accurately indicated which varieties of wheels were in relatively slight demand. A complete list of existing sizes of each type of wheel was compiled and checked diagrammatically in order to arrive at a minimum number of composite shapes, which, while meeting the then existing machine requirements, would, at the same time, relieve the grinding wheel manufacturers.

The simplified practice committee then requested the division of simplified practice to call a general conference of manufacturers, distributors, and users of grinding wheels for the purpose of preparing a simplified schedule which would be acceptable to the entire industry.

The simplified practice recommendation, which was approved by a general conference held on September 23, 1925, applied only to six types of wheels—the internal, cylinder, straight cups, flaring cups, dish wheels, and double cups. The recommendation, which was subsequently accepted by those representing more than 80 per cent of the industry, by volume of annual production, resulted in the reduction of variety from

414 existing shapes having a possible range of 715,200 sizes to 144 shapes with a maximum of 255,800 stock sizes. This elimination of stock sizes amounted approximately to 64 per cent.

### Standing committee appointed.

A standing committee of the industry, composed of two members each from the wheel manufacturers, the grinding machine manufacturers, the distributors, and the users, was appointed at the general conference and vested with the responsibility of maintaining the adequacy of the recommendation throughout its entire existence.

The recommendation, as approved by the industry, became effective January 1, 1926, for new production, and on July 1, 1926, for existing stocks.

After the original recommendation had been in effect for a period of one year the standing committee met on January 6, 1927, at Buffalo, N. Y., to consider the results. Comments and criticism received during the year

were reviewed and discussed, and it was the consensus of opinion of the committee that the demand for type No. 9, double cup, and type No. 14, offset wheels, no longer justified their inclusion as standards. Consequently, they were eliminated, thereby further reducing the number of sizes to 254,400 and bringing the total percentage reduction up to about 64.4 per cent.

### Second conference held in 1928.

At the second revision meeting held June 7, 1928, at Niagara Falls, N. Y., the elimination and additions to this program, which were of relatively small importance, counterbalanced each other, so that in effect no further reductions resulted. Nomenclature for classes of work in the grinding-wheel industry was developed for inclusion in the revised edition of the recommendation.

In order to determine accurately what this simplification has done for the industry during the three and one-half years it has been in effect, the industry made a survey among the acceptors to determine their experience with the program. The following excerpts of letters received are given:

"We are aware of many economical results from this, both as applying to the industry and as an individual manufacturer," a large manufacturer of grinding wheels said. "We can not compile any figures indicating the value of savings as a result of the simpli-

This is the ninth article of a series that have appeared in the *COMMERCIAL STANDARDS MONTHLY* on the results and benefits that have resulted from the simplification of commodities. Copies of these summaries can be had in mimeographed form from the division of simplified practice, Bureau of Standards, Washington, D. C.



fied practice, but we are satisfied that a considerable saving has resulted and it is of real benefit. We doubt if any manufacturer in this line can compile any figures representing an approximate saving, and, like ourselves, we are sure all other companies in our line will approve of the desirability of continuing the simplified practice as applying to this industry."

"Grinding-wheel manufacture is so highly specialized that it requires a considerable time in order for benefits under a simplified practice plan to be clearly defined," another manufacturer said. "There is no doubt, however, but that the elimination of many wheel sizes has resulted in economy to the manufacturers, as well as to the user of grinding wheels, and no doubt additional changes which will be made from time to time will result in still greater economies."

"We have redesigned our equipment so standard size wheels can be used," an eastern grinding machine manufacturer wrote, "and while this will not represent much of a saving to ourselves, it will to the ultimate users of our machines. It means that they can carry in stock wheels which can be used on our grinders as well as other makes, and thus make a substantial decrease in their inventory."

"We can safely say that inventory, handling expenses, and warehousing charges have been greatly reduced without any particular disadvantage to the consumer," a large distributor of tools and supplies replied. "While our investment in inventory has not been materially reduced, it has enabled us to invest our money in a larger stock of the best moving articles, thereby securing a better turnover on our stocks."

"We are heartily in sympathy with the work you are doing and fully believe that eventually it will mean that we can reduce our capital investment in inventory of grinding wheels at least 33 $\frac{1}{3}$  per cent and yet serve our trade equally as well or better than we do now," a railway, oil field, and mill-supply distributor in the mid-west said.

A grinding-wheel user wrote: "It would be impossible for us to give you a statement which would show in 'dollars and cents' whereby we are saving as a result of the work by your division. We are having prompter delivery from the grinding-wheel manufacturers, receiving our goods within a 30-day period and less, whereas 60 to 90 days was an average wait up to several years ago. We are being benefited by reduction in inventory in our plant through this simplification, which means 'dollars and cents' in the long run, but it is hard to ascertain the exact amount."

"We are able to determine a savings of approximately 5 per cent on an annual investment of \$300 in wheels," a firm of engineers and machinists using grinding wheels said. "This is almost entirely attributed to lower maintenance."

## Benefits do result from simplified practice.

From the general tenor of the foregoing, it is evident that much benefit is accruing to the grinding-wheel industry, through the application of this simplified practice recommendation. The general opinion of the acceptors is that operating costs would have been much higher had not this simplification been put into effect. Among the outstanding results recorded are reduction in inventory, less capital tied up in idle stock, a release of storeroom space, increased turnover, and prompter deliveries.

The following tabulation of acceptors may aid the reader to more readily understand the elements operating to make this recommendation effective. These acceptors are located in 36 different States and the District of Columbia.

Associations, organizations, and societies.....	14
Individual firms.....	212
Government agencies.....	7
Trade journals and technical societies who are acceptors "in principle".....	32

## Tabulation of support.

Dealing particularly with the 20 producer-acceptors of this recommendation, the tabulation below shows that small, as well as large, concerns are supporting this program.

### Minimum capitalization of producer acceptors<sup>1</sup>

Number of acceptors	Minimum capitalization	Percentage of acceptors
4.....	\$1,000,000 and over.....	20
3.....	\$500,000.....	15
6.....	\$300,000.....	30
2.....	\$100,000.....	10
1.....	\$50,000.....	5
1.....	\$25,000.....	5
3.....	Not reported.....	15
20.....		100

### Credit ratings of producer acceptors<sup>2</sup>

Number of acceptors	Credit ratings	Percentage of acceptors
3.....	\$1,000,000 and over.....	15
1.....	\$750,000-\$1,000,000.....	5
2.....	\$300,000-\$500,000.....	10
2.....	\$200,000-\$300,000.....	10
5.....	\$125,000-\$200,000.....	25
2.....	\$75,000-\$125,000.....	10
1.....	\$50,000-\$75,000.....	5
4.....	Not reported.....	20
20.....		100

<sup>1</sup> Minimum capital ratings obtained from Thomas's Register, 1928-29 edition.

<sup>2</sup> Credit ratings obtained from Bradstreets, October, 1929, edition.

Mimeographed copies of this article may be obtained on request from the division of simplified practice, Bureau of Standards.

## HOSPITAL BEDS

Simplified Practice Recommendation for Hospital Beds  
Reaffirmed by Industry for Another 2-Year Period;  
Adherence 91 Per Cent

The division of simplified practice announces that Simplified Practice Recommendation No. 24, Hospital Beds, has been reaffirmed by the industry, without change, for a period of two years. This recommendation, originally promulgated on January 1, 1925, ef-

fected a reduction in the variety of sizes and dimensions of hospital beds as follows: Number of lengths reduced from 33 to 1; number of widths, from 34 to 1; and number of heights, from 44 to 1.

A survey of production and demand, recently conducted by the standing committee of the industry to determine the degree of adherence accorded this recommendation by the trade, disclosed the fact that 91 per cent of hospital beds in 1928 conformed with the suggested list of sizes and dimensions.



## LOOSE-LEAF SYSTEM ADOPTED FOR FEDERAL CATALOGUE

Experience of Navy Department During Past 15 Years Demonstrates Value of Loose-Leaf System for Standard Catalogue; Has Been Approved for Use With the Federal Standard Stock Catalogue

By T. H. HICKS, *Rear Admiral, U. S. Navy*

Based on the past experiences of the Navy Department in the handling of its catalogue, the loose-leaf system has been utilized for the Federal Standard Stock Catalogue. The utilization of the loose-leaf system is so widespread that its merit needs no argument.

By means of addenda issued at frequent intervals corrections in the catalogue necessitated by the changing conditions of manufacture and supply in the Navy are rendered comparatively easy, since reference can be made to page and item, or when necessary, any class or any single page can be reprinted and substituted for the one on which the corrections are required.

The reprinting of the catalogue, class by class, can likewise be conducted in an orderly manner. That reprints are essential to good business is indicated by the repeated issues of commercial catalogues, many of which come out annually, semiannually, or quarterly.

In 1914, when the issue of a standard stock catalogue for the United States Navy was authorized, it was determined to publish this work in loose-leaf form, and to that end expensive binders were purchased, and for the succeeding six years the catalogue was published as a loose-leaf edition. This method of disseminating information needed for the conduct of the business of the Bureau of Supplies and Accounts of the Navy Department was entirely satisfactory, but because of difficulty with the particular type of binder used it was decided a few years later to drop the loose-leaf system for the catalogue.

### Catalogue published in two volumes.

Therefore, the 1921 edition of the Navy catalogue was published in two volumes of about 800 pages each. These were printed in pamphlet form by the Government Printing Office and then inserted in the old binders, which solved the binder trouble in a fairly satisfactory manner. The flexibility of the publication, however, disappeared entirely with this change, as it became necessary to make changes by addenda,

and to enter each change by pen in the bound volumes of the catalogues.

These changes ran into thousands and the actual clerical work necessary for transferring from addenda to bound volume required many hours' labor by many people, and, of great consequence, failure on the part of many employees to make the necessary entries. Since the catalogue is a book of reference utilized by hundreds of office and storehouse employees throughout the naval service, many complications and annoyances resulted because the catalogues which were utilized by different employees were not in accord.

In the 1924 edition of the Navy catalogue a compromise was effected, in that several small classes, or the pages of one large class, were stapled together in the Government Printing Office and the 65 classes of the catalogue issued in 17 groups. This compromise was only fairly satisfactory as to the binder phase and only partially satisfactory in making corrections and in reprinting classes. The corrections still had to be made individually, and it was rarely desirable to reprint all of the classes in any one group at the same time.

### Federal Catalogue to be loose leaf.

This experience of approximately 15 years demonstrated beyond doubt the desirability of issuing a catalogue of this character in loose-leaf form, provided a satisfactory binder could be obtained. Upon the authorization, therefore, of the Federal Standard Stock Catalogue, which will supersede the Navy catalogue and which will include stock lists and other informative data for all departments and establishments of the Federal Government, it was decided to print it in loose-leaf form.

After considerable investigation, a satisfactory binder was adopted, and it is believed that every difficulty encountered during the existence of the Navy Standard Stock Catalogue has been overcome.

## LOADED PAPER SHOT SHELLS

Acceptance of Revised Simplified Practice Recommendation on Paper Shot Shells Requested; Revision Effective January 1

A further reduction of 269 loads, in the variety of loaded paper shot shells has been effected by that industry, according to the division of simplified practice. A report of the recent revision meeting of the standing committee of the industry has been mailed to all interests for signed acceptance.

In 1924 there were 4,067 loads being made. When the industry accepts the new revision of the recommendation, this variety will be reduced to 490 loads, or an elimination of approximately 88 per cent. The modifications proposed by the industry at the latest revision conference, are to be considered effective from

January 1, 1930, subject to acceptance by the industry. All loads not included in the revised recommendation are to be supplied as standard loads only until stock on hand, as of January 1, 1930, shall have become exhausted.

The action of the revision conference, while based on a survey of existing conditions in the industry, is susceptible of such modifications as future trends in the industry may render desirable.

A special article on the results and benefits of applying simplified practice to loaded paper shot shells, by J. F. McNeil of the division of simplified practice, appeared in the October issue of the *COMMERCIAL STANDARDS MONTHLY*. Complimentary copies of this article may be secured upon request to the division.



## OBSOLETE AND INACTIVE PATTERNS

### Machine Builders and Founders Exchange Information About Their Practices for Handling These Patterns in Report Issued by Insurance Company

NOTE.—This discussion on "Obsolete and Inactive Patterns" is based on the pamphlet of the same name released by the policyholders, service bureau, Metropolitan Life Insurance Co. The company has kindly given its permission to the publication of the article in the *COMMERCIAL STANDARDS MONTHLY*.

When to dispose of the little-used or obsolete pattern constitutes one of the difficult problems of industry which affects the small firm as well as the large one. The purpose of this report is to present methods in current use by different companies in various fields of industry, in the hope that the information here compiled may be helpful to those confronted with this question.

The money expended for storing patterns is evident from the amount of storage space used. One firm has no less than 12 large warehouses filled with patterns. Another has 9. Others range from 1 to 7 or 8. The Ingersoll-Rand Co. has among their eight large warehouses devoted solely to pattern storage one which is 600 feet long, 50 feet wide, and 3 stories tall. The Sessions Foundry Co. has three good-sized warehouses for storing its patterns, one being a large 5-story building of modern construction. The B. F. Sturtevant Co., which has manufactured fan, blower, and allied products for nearly 70 years, has accumulated a tremendous number of patterns. Its line is so varied that it may be called upon to furnish no less than 1,000,000 different repair parts, many of which are castings. At the present time the company is obliged to carry nearly 100,000 different patterns.

Several factors are to be considered before formulating a definite policy pertaining to the retention of patterns which are seldom used. One is the value of the pattern measured in terms of its replacement cost and the other is the obligation of the company to the customer to furnish repair parts or castings which require that particular pattern.

The value of a pattern ordinarily should be balanced against its cost of storage. An obsolete pattern might easily absorb more than its worth in storage cost over a given period of time. Often it is more economical to replace occasionally a pattern that has been destroyed than to invest thousands of dollars in storage facilities for patterns that are not being utilized. No standard practice appears to be in use in the amortization of the pattern account. From replies received from companies all over the country in different fields of manufacture, the rate varies from 10 to 33 $\frac{1}{3}$  per cent a year.

A wide difference of opinion exists concerning the obligation of a company to its customers in the mat-

ter of furnishing repair parts. It is interesting to note that the B. F. Sturtevant Co. recently had returned to it for repair a fan that was sold in 1865. The customer did not want a new one. The Krementz Co., of Newark, N. J., several years ago received for replacement a 25-cent collar button of its manufacture which had been in continual use for more than 30 years.

#### "Obsolete," definition of the term.

The term "obsolete" ordinarily means having gone out of use. However, when applied to patterns the word takes on a different aspect. A pattern which may be classified as obsolete in one industry may not be in another. The type of industry and the nature of the product should be the determining factors in the interpretation of the word "obsolete."

Manufacturers of heaters, boilers, and stoves frequently are called upon to furnish new grate bars and analogous parts for units of their manufacture which have been in service many years. The sides of the stove rarely require replacement. Therefore, patterns for old grate bars would not be classified as obsolete, whereas those for the sides of the same stove may be so considered. The nature of the product itself would govern the definition in this instance.

A large stationary steam engine of standard manufacture may have a life of 35 or 40 years in service. Its initial cost runs into a sizable figure. So long as the engine is in operation parts for the engine which, because of wear or otherwise, may ordinarily require replacement, should be available to the owner. The maker of the engine can not, therefore, consider the patterns for those parts as obsolete, even though they may remain unused for a long period of time.

In the foundry a different situation exists. The average jobbing foundry usually has on hand many patterns that belong to its customers and which it is obliged to store as an accommodation. The foundry has but little control over these other than the knowledge from its own records as to their activity. The foundry is not in a position to judge the obsolescence of the patterns in question but must be guided entirely by the owners' wishes.

The Singer Manufacturing Co. provides many metal patterns of each part for mounting on its molding

There is hardly an industry which has not been affected by changes in demand, caused, in part, by the breaking down of old customs, brought about in the war period, and also, and probably more important, by the increased buying power of consumers and the generally higher standards of living. Industries which were set up 10 or 15 years ago to cater to a certain type of demand now find that they are being left by the wayside because the standards of living have increased faster than they have changed and improved their products. Those changes in demand also have been caused by keener merchandising by the manufacturers and merchants and by better sales promotion.



machines. When a class or style of machine is superseded by a new model all the obsolete metal patterns are destroyed with the exception of one set which is kept to fill orders for spare parts over a period of years. In this case the pattern becomes obsolete when a new model is brought out to supersede the machine using a casting which required that particular pattern.

#### Setting standard.

Some effort has been made to set a definite method of procedure as standard in several fields of industry. To this end a number of trade associations have set standard practice recommendations for the guidance of their membership. The Ohio State Foundrymen's Association and the Newark Foundrymen's Association have adopted a "Uniform trades custom," which provides that patterns not in use for six months shall be subject to storage charges. The Steel Founders Society have issued a circular covering recommended trade customs, Section II of which reads as follows: "The foundry shall not be expected to provide storage for patterns for which no orders have been received during a period of two years."

The "Standard trade customs" adopted by the Malleable Iron Research Institute incorporates the following under item 15: "The foundry shall not be expected to provide storage for patterns for which no orders have been received during a period of two years." The Machinery Builders Society, upon the recommendations made by its committee on obsolete and inactive patterns, recently adopted the following as standards for its membership: "(a) All patterns, jigs, and fixtures which are special for a job and not likely to be used again should be scrapped at the end of the guaranty period; (b) All other patterns, jigs, and fixtures that have not been used for a period of five years shall be scrapped; (c) The customer shall be charged with the cost of replacing any of the above that have been destroyed after the stated period, the customer being advised of this fact on receipt of his order for repair parts."

The National Machine Tool Builders' Association states that, with the progress in machine-tool design, the average life of the design of standard machines seems to be about seven years. Therefore, if economic life in the users' hands be counted as 10 years, the user of the last machine produced on the design would be getting reasonable service if he could get a repair part from the original pattern 10 years after the last machine of that design was made. This would give the user of the first machine of this design 17 years in which he could obtain a repair part from the original pattern. This association, therefore, advocates that machine-tool manufacturers should not under ordinary conditions carry patterns longer than 10 years after delivery of the last machine of that type.

#### Utilizing patterns.

Many companies have found it not only economical from a cost standpoint, but also an aid in reducing the number of patterns to be stored, to make over the old pattern wherever possible into the new one. This, of course, necessitates cooperation on the part of the engineering department in so designing the new part that the old pattern can, at least in part, be utilized. It is well so to redesign the part that the new one can also serve as a replacement part for the old model.

The Swartwout Co. finds that as a rule a pattern becomes obsolete when the company is building a revised model, but quite often it is possible to work the old pattern over to make a new one. The Terry Steam Turbine Co. endeavors in every case to redesign parts for their machines so that they will readily fit into the place of the old one should replacement be necessary. In this case the obsolete pattern is immediately destroyed.

Perhaps the most common procedure has been to cull out obsolete patterns whenever the storage space has become cramped. This method does not provide an efficient solution to the problem. A review of the more effective methods reported by some of the companies cooperating in this survey may be helpful.

#### Drives to eliminate patterns.

The Falk Corporation has on occasions made periodic drives to eliminate some of its patterns. It found that invariably after this procedure it ran into difficulties, as its customers shortly afterwards ordered castings from the patterns which were discarded. The De Laval Steam Turbine Co., on its last drive to eliminate some of its obsolete patterns, destroyed a large pattern. Six months later this pattern was called for and had to be replaced at a cost of \$1,500. The National Cash Register Co. disposes of its obsolete patterns because the company finds that the cost of remaking the few patterns which may be called for later is less than the storage costs would be if all were retained.

One of the plants of the Ingersoll-Rand Co. has found it better business occasionally to replace a pattern that has been destroyed than to invest thousands of dollars in storage facilities for patterns that are not moving. The greatest care is exercised before any pattern is destroyed, and it has been found necessary to replace only a few.

#### Definite time interval.

Some companies have adopted a definite time interval of inactivity of the pattern before it is to be destroyed. This procedure is rather precarious, although it has proved a satisfactory solution to the problem in certain individual instances.

The E. W. Bliss Co. destroys all patterns which have not been used in five years. The company also gives consideration to the advisability of destroying some which there is reason to believe will not be used again, even though they may not be 5 years old. The R. D. Nuttall Co. disposes of all patterns not used by it for 10 years. Before destroying a pattern, however, the company makes a careful study to ascertain if there is not a possibility of revising it to meet any later requirements.

The I. P. Morris Corporation recently established the ruling that patterns not used for 5 years are to be destroyed. On some of the largest of its turbines on which the patterns cost is relatively small as compared with the ultimate cost of the product and for which there is not likely to be any demand for duplication or replacement for at least two years the patterns are destroyed as soon as all castings made therefrom are machined and tested. The firm has found after a period of six months in which this ruling has been in effect that there has resulted a reduction in pattern storage area of about 75 to 80 per cent.

Another method is to have the engineering department or the sales department make the final decision



as to the disposition of the patterns. Every 10 years the Brown & Sharpe Manufacturing Co. reviews all of its patterns which have been inactive during that period and destroys those decided upon after proper consideration by its engineering department. The Builders' Iron Foundry examines its patterns at least once a year, at which time it discards all those which are obsolete. In this process the salesmen are consulted on those patterns in which they may be most interested. The effort is on the side of having too few rather than too many patterns, but in actual practice the firm has found a good many that do not pay by their use for the space occupied.

Sometimes there are in an organization one or two members fully qualified to take action on the patterns, and where such is the case their decision is final. An example of this may be found in the practice of a large mid-western company who go over their patterns annually and all obsolete patterns are immediately scrapped. The responsibility for the decision is left to the man in charge of patterns and the assistant to the president who is thoroughly conversant with the sales and service needs.

#### **Retaining all patterns.**

There are instances where, because of the nature of a product or the policy of a company, all patterns are retained even though they would ordinarily be classed as obsolete. The Skinner Engine Co. has found it has to supply repair parts for engines which it built 25 to 30 years ago. It feels, therefore, obliged to keep all its patterns, and no obsolete classification is attempted.

The Busch-Sulzer Bros. Diesel Engine Co. maintains patterns for its commercial product as long as the engines are in service. This necessitates extensive pattern storage, but since the longer a machine is in service the more likely replacement parts will become necessary the company does not believe it is advisable for it to destroy patterns even 25 years old.

The Riley Stoker Corporation has been engaged in the stoker business for almost 50 years and has in that time accumulated a great many patterns. As long as a stoker of the firm's manufacture is in service it feels duty bound to supply renewal parts whenever required. The Waterbury Tool Co. keeps the patterns of its regular product indefinitely, as do both the Murray Iron Works Co. and the De La Vergne Machine Co., since they believe it is to their advantage to be able to supply repair parts for their respective machines whenever called upon to do so.

#### **Certain classes retained only.**

Some firms retain certain classes of patterns but destroy others, the procedure depending, as before suggested, upon the nature of the product. There are many instances where only specific parts of a unit would under ordinary circumstances need replacement within the life of the unit. In these cases it would obviously be of no particular advantage to retain and store all the patterns for the complete unit.

The United States Radiator Co., for instance, finds it necessary to keep only the patterns of parts of its various products which are subject to wear. Years after a heating boiler is installed in a residence an owner would resent being put to a heavy expense to replace his entire boiler simply because the manufacturer was unable to furnish a grate bar which had burned out. A grate bar of obsolete pattern, even at

what appears to be exorbitant price per pound, is an economical repair.

The Buckwalter Stove Co. found it good practice to destroy, after a reasonable period of time, all patterns for its stoves with the exception of the fire boxes and the fire-box parts. The B. F. Sturtevant Co. destroys all patterns of any special designs which have not worked out to be salable in any volume. This aids in keeping the pattern storage space free of any unproductive patterns.

When a large part of a piece of equipment fails after a number of years of service the cost of the repair usually approaches closely the cost of a new unit. With a little calculation of obsolescence, a new sale can often be made, and the manufacturer is money ahead to encourage this transaction by making a scrap value allowance for the old unit.

#### **Jobbing-foundry methods.**

Several methods are pursued by jobbing foundries. One is to keep all customers' patterns until called for. This may work a hardship on the foundry, and often necessitates the foundry's requesting the customer to give permission for the return of certain patterns, which permission may or may not be given. In one such case a foundry, after the first request was not answered, asked its customer again, this time stating that if the patterns in question were not removed by a specified date they would be put outside. This method obviously is poor practice. It not only causes the foundry to stand a large share of the burden of storage but also presents possibilities of unpleasantness with customers.

Another method adopted by some foundries is to have an understanding with the customer that all patterns not active will be retained without charge for a definite period of time only. After the expiration of this time and upon the notification by the foundry storage charges are made to the customer for retaining his pattern. This system is found more equitable for both the foundry and the customer and precludes the possibility of difficulties which may arise when no time limit is placed upon the storage of customer's patterns.

#### **Reclassification.**

The practice of the Barber-Colman Co. gives an interesting example of the reclassification system for the handling of obsolete patterns. In its pattern storage the company has reserved certain shelves for the storage of obsolete patterns, and at intervals of three years these patterns are checked by the engineers interested, who decide which patterns are entirely useless and those that may be needed at some future date for making castings for repairs.

The patterns which are found to be entirely useless are destroyed and the patterns which there may be occasion to use are packed in large boxes and the boxes stored in a space in the warehouse assigned for this purpose. Each box of patterns is given a number and a complete record of its contents is made and kept for reference, so that at any time need for one of these patterns develops it can readily be located and used, after which it is returned to its box.

The George D. Roper Corporation classifies its patterns as (1) active, (2) inactive, and (3) obsolete. The inactive patterns are stored with the active patterns and occupy about twice as much space. They



are considered inactive because they are used only for furnishing repairs, and some of them are almost 20 years old. The obsolete patterns are stocked in a separate space and kept for their salvage value. This space occupies about one-fifth the space required for the active patterns.

Fairbanks, Morse & Co. remove their patterns to their service department pattern storage as soon as a product is discontinued. The warehouse is checked two or three times a year and as many patterns are disposed of as possible.

#### Card system.

A system which has many valuable features is a card index of all patterns. When properly applied this is reported to be of inestimable value in solving the obsolete pattern problem. The Allis-Chalmers Manufacturing Co. maintains in its pattern shop a card index of all patterns. On each card it posts the date the pattern is taken out of storage and used in the foundry, as well as the date it is returned to storage. The cards act as a guide to the activity of the patterns, and lists are prepared several times during the year showing patterns which have not been used during a period of approximately five years. These lists are then forwarded to the various engineering departments for their recommendations as to whether the patterns are to be retained in storage or destroyed.

It does not necessarily follow that any pattern which has not been used during a period of five years is to be destroyed, as the engineers who make the decision may consider the pattern to have sufficient prospective value to justify the expense of continued storage. The period of activity, therefore, is not the sole consideration, as the engineers, familiar with all the facts involved, must weigh the going value of the pattern against the cost of storage as well as the company's obligation to its customers in furnishing repair parts.

#### Periodic survey.

Numerous companies make periodic surveys of their patterns in storage in order to determine which are obsolete and can be destroyed. Several methods are in use. One is to review the records of the various patterns to ascertain their activity. This is usually done either by a special representative who is familiar with the patterns, sales, and production, or jointly by members of the sales and engineering departments who are fully acquainted with all the factors involved.

The National Cash Register Co. makes semiannual inspections of all its patterns that are not in actual

use and that have not been used during the previous six months. These are then laid aside, and all patterns for which there has been no call during the year are passed upon by the inspection committee. This committee consists of the men in charge of the pattern, foundry, general machine, tool room, and tool-supply departments. They are familiar with the requirements and are in a position to determine whether the patterns will be used in the future. The pattern is scrapped when the committee so decides.

The procedure followed by the Morgan Construction Co. presents a very interesting example of the application of this method used in conjunction with a card system. The company places full responsibility for its pattern policy in its pattern committee, which is composed of the general superintendent, chief draftsman, a designer, pattern-shop foreman, pattern records and storage man, and the treasurer of the company. The committee meets at least once a month. It takes into consideration three factors in determining the obsolescence of the patterns: (1) Notification by the engineering department of a change in design. (2) inactivity of a pattern for five years (this is determined by reference to the pattern record cards), and (3) notification from pattern-storage department of irreparably poor condition of a pattern.

Pattern-record cards covering about 200 patterns are reviewed by the pattern committee. Notations are made on the cards through the use of two rubber stamps, one reading "Scrapped" and the other "Reviewed." The latter stamp indicates the decision of the committee to withhold scrapping the pattern until a later date. In every case where a pattern comes before the committee for consideration a dating stamp bearing the meeting date is imprinted next to the stamp showing the committee's decision.

Following the meeting the record cards of patterns which have been declared obsolete by the pattern committee are turned over to a secretary who prepares notices to be sent to all customers who have previously had castings made from the patterns in question.

These are sent out with a statement that the patterns have been declared obsolete and giving the customers an opportunity to purchase spares or castings from the patterns within 30 days after date of notice. This procedure avoids in large measure the possibility of scrapping a pattern one day and receiving an order on the following day for a casting from the pattern.

The records of the pattern committee from 1924 to 1928 indicated a total of 8,959 patterns scrapped during that period.

## NEW SIMPLIFICATIONS SUGGESTED

### Division Asked to Cooperate in Developing Recommendations Covering Toy Sleds and Marking of Motion-Picture Films

The division of simplified practice receives many suggestions for simplification. Two such proposals received during the past month are listed below. Manufacturers, distributors, and users of these commodities are invited by the division to submit any comments which will be helpful in determining the interested industry's attitude toward these projects.

**Marking of films.**—A motion-picture company has advised the division of simplified practice of the need in the industry for a uniform system of marking the

emulsion side of films. This suggestion has been referred to manufacturers of films for their consideration and comment. Should it develop as a result of the inquiry that the proposal is a practical one, an effort will be made to interest the industry in drafting a simplified-practice recommendation.

**Sleds (toy).**—The Toy Manufacturers of the U.S.A., have suggested the need for reduction in variety and sizes of sleds, now offered, and the division of simplified practice has been requested to assist the industry in the development of a program. In the opinion of those concerned, such a program is needed, since it will help the industry in the solution of some of its important problems in merchandising this commodity.



## SIMPLIFIED PRACTICE—THE SILENT PARTNER OF PROGRESSIVE BUSINESS

**Desire to "be Different" Has Led to Costly Overdiversity in Manufacture; Simplified Practice, to be Really Effective, Depends Upon Cooperation of All Elements**

By S. F. TILLMAN

By far the larger proportion of all supplies used in building construction are distributed through the retail dealer. An important and rapidly growing business factor in each local community, the retail dealer has a strong influence on the choice of materials used. It has been estimated that this "family" has something like 25,000 members in the United States.

Add to this family of 25,000 retail dealers one business partner, not active. Add to this one great competitor. Thus we have the eternal triangle—dealer, partner, and competitor. The "silent partner" is simplification, the "competitor" waste. How can the one be made more valuable and the other eliminated?

Hercules in undertaking his legendary 12 tasks had no greater problems than those which modern commerce and industry faces. To maintain fair profits despite high cost of raw materials and other operating expenses and yet to maintain wage levels has seemed a well-nigh impossible task to many members of the business world in recent years. In seeking means to overcome these problems many industries are discovering that their greatest handicap is waste. Therefore, this is a subject of vital concern to one of the largest business groups—the retail building material dealer.

Simplified practice as a practical method of reducing industrial waste is now widely recognized in the commercial world as one of the most significant economical and industrial movements of the day. It is being applied to eliminate avoidable waste growing out of the production of needless variety in types and sizes of commonplace articles. Obviously, the idea of eliminating the unnecessary varieties in products, or maintaining standard certain most useful articles, will not only make its influence felt in the amount of stock investments and in the rate of turnover but will enable the retail dealer to give better service and value with lower overhead costs.

### Recommendations promulgated.

To date simplified practice recommendations that have been extended to this line include the following of interest to the dealer handling building materials: Vitrified paving brick reduced from 66 to 5 varieties; metal lath, from 125 to 4; asphalt penetrations, from 88 to 9; files and rasps, from 1,351 to 496; rough and smooth face brick, from 75 to 2; common brick, from 44 to 1; range boilers, from 130 to 13; hollow building tile, from 36 to 20; structural slates for plumbing and sanitary purposes averaged 84 per cent in reductions; roofing slates, thicknesses and sizes, were reduced from 251 to 25; forged tools, from 665

to 351; builders hardware averaged 26 per cent in eliminations.

Sizes, widths, and weights of asbestos-paper rolls, from 72 to 12; while the sizes and thicknesses of asbestos mill board were reduced from 21 to 4; brass lavatory and sink traps, from 1,114 to 72; hot water storage tanks, from 120 to 14; steel reinforcing bars, from 40 to 11; sheet steel, from 1,819 to 263; concrete building units (length, width, and height of blocks), from 4,076 to 1,758; sand lime brick (length, width, and height), from 14 to 3; paint and varnish brushes, from 480 to 138; shovels, spades, and scoops, from 5,136 to 2,178; sidewalk lights, sizes from 120 to 6, styles from 80 to 5, and shapes from 10 to 2; staple vitreous china plumbing fixtures, from 441 to 58.

The varieties remaining after the elimination are known as the "simplified line" and selections should be made from this simplified schedule whenever possible.

### Public has interest.

Inasmuch as waste in commerce and industry falls into a number of classes and while they are of immediate interest to the manufacturing and distributive agencies, the public has an interest greater than either, for the consumer pays the ultimate cost, either in the price of the goods or in the loss of quality. As this waste runs into billions annually, any step in elimination will be interpreted in savings which must ultimately be passed on to the consumer either in the quality or quantity of the goods he buys or in service in other forms.

By adopting simplified practice wherever possible, the producer or manufacturer will have (a) less capital tied up in slow moving stocks; (b) more economical manufacture due to simplified inspection requirements, longer runs with fewer changes, less idle equipment, less stock to handle, reduced clerical overhead; (c) more permanent employment as contrasted with present seasonal employments; (d) larger units of production and less special machinery; (e) more prompt delivery; (f) less chance of error in shipment; and (g) less obsolete material and machinery.

To the retail building material dealer it will mean (a) increased turnover; (b) elimination of slow-moving stocks; (c) staple line, easy to buy and quick to sell; (d) greater concentration of sales efforts on fewer items; (e) decreased capital invested in stocks and repair parts on hand; (f) less storage space requirements; and (g) decreased overhead, handling charges, and clerical work.

And to the third member of the triangle, the consumer, it will mean (a) better values than otherwise

You can help squeeze The Waste out of industry!

How can you help?

If you manufacture, simplify your line.

If you sell, deal in the simplified lines.

When you buy, buy the simplified articles.



possible, (b) better service in delivery and repairs, and (c) better quality of products.

#### Values cited.

It is an old saying and a true one that the proof of the pudding is in the eating. Paraphrasing this, the proof of the value of simplified practice is in the reports received by the division of simplified practice from acceptors. To illustrate, the Youngstown Pressed Steel Co. recently said: "We were starting in business about the time that simplified practice was first applied to the metal-lath industry. No one can offer any argument against reduction from any standpoint. We have been able to reduce our inventories, reduce our stocks, and to reduce our losses on account of obsolescence."

The Berger Manufacturing Co., of Canton, Ohio, reported that "it results in smaller inventories, quicker turnover, lower selling expenses, and, what is very important, lower costs in the factory; that it is very beneficial both in manufacturing costs and distributing costs."

The Bass-Hueter Paint Co., of San Francisco, reported: "We have in the past year or so cut down our line of paint and varnish brushes, and by so doing have made some reductions in inventories," while the Osborn Manufacturing Co., of Cleveland, wrote: "We are not primarily manufacturers of paint and varnish brushes. We distribute rather large quantities of these goods which we have made for us under our own brands. The work of your division in reducing the number of varieties has, in our judgment, been very definitely helpful both to manufacturers and to distributors of these goods. We should say, unqualifiedly, that the effort toward simplified practice has produced helpful results and that industry and the public in general would suffer should the work be abated."

The American Paint and Varnish Manufacturers Association reported that "in a general way we can assure you that the simplification adopted some years since by this industry has proved of considerable eco-

nomic value to producers as well as to distributors and consumers."

From these excerpts of letters received by the division of simplified practice from acceptors of simplified practice recommendations it will be seen that the recommendations are sound and feasible.

#### "Keeping up with the Joneses" expensive.

This effort to be "different" has been a most disastrous one for many of the business firms. "Keeping up with the Joneses" in the matter of producing variety of goods has resulted in needlessly large investments, seasonal occupation, slow turnover, and an accumulation of seldom-called-for items, the disposal of which has been possible only through so-called "bargain sales," and the losses from which have been added to the cost of the "fast-moving items." Experience of the division in aiding industries to eliminate these wastes has shown that in the average industry, prior to adopting simplified practice, approximately 80 per cent of the demand is met by 20 per cent of the varieties manufactured, and studies of dealers sales often show this is true in merchandising.

Retail building material dealers, accepting the simplified practice recommendations will be able to reach out for new markets because their time will not be wasted in an effort to sell articles of a similar nature but with inconsequential differences. They will be able to do away almost entirely with the "bargain sales" of slow-moving or "dead" stocks and concentrate on "live" or fast-selling lines. This assures better profits. An authority states that in building material merchandising 77 per cent of the net sales represent the cost of the goods, 17½ per cent covers operating expenses, leaving a net profit around 5½ per cent.

Simplification has proven its worth as a profit builder in the merchandising of other lines of goods, and it is logical to assume that, if given a fair chance, it will prove its value in this respect in the building-material field. Dealers who stock "the simplified lines" and advertise the fact will cash in on the savings resulting from the elimination of seldom-wanted and therefore "profit-eating" lines.

### NEW DIVISION FORMED

Department of Commerce Organizes New Division of Public Construction; John M. Gries Appointed Chief

A preliminary survey by the new division of public construction, just created in the Department of Commerce, at the request of President Hoover, reveals widespread, prompt, and efficient mobilization of effort to expedite public construction, in response to President Hoover's appeal for the cooperation on the part of governors and other public officials.

The newly organized division, which is under the direction of Dr. John M. Gries, of Ohio, former chief of the division of building and housing of the Bureau of Standards, serves as a clearing house of information on methods and plans. In general, it is helping to coordinate the efforts of the Federal Government departments and of State and local governments in their programs to help to stabilize business and employment conditions by speeding up construction projects.

The State governors, in response to telegrams from President Hoover, have assumed responsibility for carrying out the idea in their own States and for encouraging similar efforts on the part of county and municipal officials. Some of the governors have indicated that they wish to be informed of measures and methods being used elsewhere, particularly where the best results are achieved, and the division of public construction is analyzing the reports already in hand from this point of view.

The new unit is also making an intensive study of Federal Government projects now under way, or which can be put in motion within the next few months. Such information on the position of the many Federal departments and bureaus which carry on construction is necessary for the most effective mobilization of the Federal Government's own efforts.

Facts on many phases of the problem are already in the hands of Doctor Gries as a result of the study of public works by the division of building and housing and the National Bureau of Economic Research.



## BUILDING BETTER NET PROFITS

**"Where Will My Profits Come From in 1930?" Theme of Address by Ray Hudson Before New York State Builders Supply Association; Said That Money Saved Through Cutting the Costs of Doing Business Strengthens Net Profits**

By RAY M. HUDSON

"How am I going to make a fair profit out of my business in 1930?" is the question uppermost in the minds of business men to-day. My purpose is to help you, if I can, in finding the answer to that question. The first step in the solution of any problem is a review of all the facts, a survey of the current situation.

As you all know, there has been a decline in building for the past year. The cumulative value of contracts awarded during the first 10 months of 1929 was \$5,064,180,000 as against a total of \$5,731,948,000 in 1928. This is a 12 per cent decrease. However, the total thus far for 1929 is only 5½ per cent less than in either 1927 or 1926.

The National City Bank, of New York, in its December 1 letter, using the figures of the F. W. Dodge Corporation, forecasts a total construction outlay of \$5,680,000,000 for 1929, or 14 per cent less than that for 1928. If construction were to continue to decline at this rate, you would, indeed, have cause to worry, but indications are that conditions will get better rather than worse through 1930.

Col. L. P. Ayres, noted economist and vice president of the Cleveland Trust Co., predicts among other things for 1930: First, the total value of new building construction will not vary from the 1929 total by more than 5 per cent; second, there will not be much change in the cost of building construction, although there will be a moderately declining trend; third, the average hourly industrial wage rates will not differ by more than 3 per cent from present levels; fourth, it is unlikely there will be much change in the cost of living.

### **Banks express opinions.**

The Union Trust Co., of Cleveland, says that "the shift in the credit situation, with lower interest rates, should help industries dependent on long-term financing," and names the construction industry as a beneficiary of the upward trend in bond prices. This same view is held by the Guaranty Trust Co., of New York City.

At the meeting of American business leaders and executives at the Chamber of Commerce of the United States on December 5, practically everyone who spoke emphasized the importance of construction as a stabilizing force; and you know from the press reports the vast amount of work projected by the Federal, State, and municipal governments, the railroad, public utilities, etc.

You are well aware of President Hoover's deep interest in the construction industry, as evidenced in his recent recommendations for a nation-wide public-works program. You know of the response of the Federal authorities, the governors of the several States, also county and municipal authorities, to the President's recommendations, and of the steps being taken to translate that response into action.

However, it can not be expected that this program will automatically go into effect, nor should you look to any single individual, organization, or agency to carry the whole burden of maintaining a steady volume of construction through 1930. The job is so large there is a chance for everyone who wishes to do so to cooperate in it; and I know of no group that is more vitally concerned in this matter of stabilizing the construction industry than the 26,000 or more building-supply dealers in the United States, and of which number the retail building supply dealers of New York State form so large and so substantial a part.

A nation-wide result is only the sum total of the results obtained in each town, city, county, and State in the Nation. Your problem thus boils down to finding out the opportunities for construction in your respective communities and then mobilizing all local interests and local resources to translate these opportunities into actual work; that is, the employment of labor, and the purchase of building material, supplies, and equipment

will then follow.

### **Construction opportunities in 1930.**

Broadly speaking, construction divides into two major classes, viz, engineering and residential. Under "engineering" comes practically all commercial building, public works, such as public buildings, streets, roads, sewers, water works, dams, river and harbor improvements, railroad construction and bridges, and all industrial construction that calls for the work of an engineer, such as factory buildings, power house, grain elevators, cold-storage warehouses, etc.

That there will be considerable work of this kind is forecast in the proposed expenditures of the Federal and State Governments, many of our cities and towns, our principal railroads, and industrial organizations. Your job is to watch for the awards for this work in your respective territories and be diligent in your efforts to get the orders for the materials that will be used in these jobs.

This article is the speech delivered by Ray M. Hudson, resigned Assistant Director of the Bureau of Standards, for Commercial Standards, last month before the meeting of the New York State Builders' Supply Association, in Syracuse, N. Y.

Although the subject was directed toward the building-supply industry, it is believed, however, that the contents of the address should appeal to all business men at this time.



In the residential end of the construction industry there are several encouraging prospects. First is the modernization program projected by the Home Modernizing Bureau. This bureau was organized in April, 1928, with Walter J. Kohler, now Governor of Wisconsin, as its first president. Some 47 associations in the construction field are represented in this bureau. It is estimated that in 1929 modernizing of existing structures brought upward of \$500,000,000 to the building industry and a large part of this sum represented the purchase of building materials and supplies.

#### **\$24,000,000,000 worth of work to be done.**

It is estimated there is potentially \$24,000,000,000 worth of modernizing work to be done, and it is contemplated that \$2,000,000,000 worth, or one-twelfth of this total, will be done in 1930.

The 20,000,000 one and two family houses in the United States average 13 years of age, even though many new houses have been built since the war. Out of this 20,000,000 it is said 12,000,000 need modernizing. Kitchens, staircases, cellars, roofs, plastering, etc., need repairs. Added rooms in cellar or attic, added porches and sun parlors could be used to advantage. Many an old woodshed or small barn back of the house could be torn out and a modern 2-car garage built in its place. If the owner doesn't have two cars he can probably rent the extra stall to some neighbor who now parks his car on the street all night to the detriment of the car and to traffic safety.

New exteriors for old houses often add more to sales value than they cost.

Twelve million people living in cities of 10,000 or more have no bathrooms. More than a million homes within central station areas are not wired for electricity. Of the millions of houses that are wired it is estimated that three out of four are already obsolete, judged from present-day standards of design and construction.

Therefore, there is in this program of modernization a large opportunity for material sales in 1930. Some new homes will also be built in 1930, probably not as many as in 1928, but at least as many as in 1929. This forecast is based on my firm belief that business will be fairly good after the first quarter of 1930; that industrial employment will be steady and wages will stay at present levels; and that people as soon as they get over their present fears and doubts will go on with their plans and ambitions. Spring is always a tonic to people, and if you begin now to ask your home-town folks what they are going to do this spring you'll set many to thinking what they might do and figuring what they can do. If you cooperate with friendly constructive suggestions and ideas for building the new home or modernizing the old one, or putting up that new garage or barn, you will undoubtedly reap the harvest when good weather comes.

#### **Cooperation needed.**

Then, too, some will tell you of things they'd like to do if they could get the money. Well, why not tell them how they can get the money and maybe help them get it. Surely you and your local bankers or building and loan associations can work together in a cause as worthy as this. The local banker wants to see his money out at interest; property is good se-

curety. Helping a good citizen to enhance the value of his property is a good thing for your town, for him, and should be for you.

In New York State you have, I understand, your own land bank and the State has purchased \$1,000,000 of its bonds. This institution, the only one of its kind in the country, loans the proceeds of its bond sales to building and loan associations, taking their mortgages as security. It thus becomes a discount bank for the associations on a long-term basis. The associations, I understand, purchase \$5,000 worth of stock in the land bank for each \$100,000 they borrow, and additional funds are thus provided. With your 325 building and loan associations, their 600,000 members, and their \$300,000,000 of resources, next year should be an easier one for the men who want to borrow to buy or build a home.

Many people who do not now own their homes would like to. Their problem is that of financing the purchase. I, for one, believe it ought to be as easy for a man to buy a home as an automobile, and that everyone concerned with home building, the realtor, the architect, contractor, material dealer, banker, building and loan association, and the prospective home owner's employer, ought to cooperate in working out a short, simple, and fairly easy path to possession for that potential home owner.

#### **Sells "The house complete."**

The Hartman Corporation, of Chicago, sells "the house complete." This includes the house, the furniture, draperies, floor coverings, electric refrigeration, water heater, heating apparatus, and all modern labor-saving devices.

The company has over 85 different house designs for the buyer to select from. These range from \$5,000 to \$20,000 apiece and can be paid for on a 5, 10, or 15 year term basis. The only stipulation is that the customer have a clear title to the lot on which he wishes to build. He signs one paper covering everything and then pays a definite amount per month. The company employs local contractors and buys materials from local dealers and thus builds good will in the community in which it operates. The success of this company with this new and novel idea suggests the possibilities of its application in New York State.

Our Department of Commerce has issued two very helpful booklets, one on How To Own Your Own Home; the other on Present Home Financing Methods. I suggest you get stocks of these booklets and pass them out judiciously to good prospects along with other advertising material. They can be ordered from the Superintendent of Documents, Government Printing Office, Washington, D. C. Though they sell for 5 cents each, they can be bought for about half that price if ordered in quantity.

#### **Covering losses due to deaths.**

Another significant development is found in the recent action of a well-known insurance company which is now arranging with banks to cover losses due to the death of borrowers. Now the banks insure, under the group plan, those to whom they make personal loans. The death of the individual will not then endanger or delay collection of the loan. The working out of this plan has advantages both to the public and to the banks. Prospective borrowers need not worry about the effect of a loan on their estates and the



future welfare of their families. More business will come to the banks. Loaning power of the banks may be increased somewhat by removal of the danger that personal loans will become slow or uncollectible in the case of death.

Building-material dealers might encourage their local banks to take out this kind of group insurance as a means of making it easier for people to get loans to modernize their homes or build new ones.

One more recent development which should be of interest to you is the program of industrial development of the Niagara-Hudson Power Corporation. This company, I understand, plans to cooperate with local chambers of commerce in locating and developing new industries and otherwise increasing the use of power. This suggests your close contact with your local power companies and working with them in programs that mean modernization of existing factory buildings or putting up new buildings to house modern electrified machinery and equipment.

All material-producing interests, from the cement industry to the shingle manufacturer, are either engaged in or are contemplating advertising and sales-promotion programs, designed to stimulate interest in and purchase of their products. As distributors and dealers, it will be to your advantage to draw on these manufacturers for all the help they can give you in marketing their products. Make them see that the more they help you to cut down sales resistance, to open up new markets, to develop new uses, etc., the more you can do for them in the nature of larger sales.

So far I have tried to picture some of the developments, activities, and forces that will operate to stimulate construction and thus open the way for building-material sales. Now, for a brief review of what can be done inside the business, in your own office, storage yards, warehouses, etc.

#### **Suggestions offered for 1930.**

First is a careful analysis of your 1929 sales as to profit sources. You can find which classes of materials or lines of products which have yielded the best profits. You will find certain staple items turning over with fair regularity, though at a small margin of profit. In other words, what line yields the best profits on a volume basis? You will find certain specialties turning slowly but with a larger margin of profit.

Careful analysis for profit sources should show what combinations of staple and specialty lines on which you should concentrate through 1930. Studies of "costs of doing business" are always profitable in the

leaks and losses they reveal and the consequent chances to save money. The Bureau of Business Research, Harvard University, has cooperated with nearly 300 building-material dealers in a study of this kind.

Money saved through cutting the costs of doing business strengthens net profits. Many dealers make the mistake of carrying too many different lines of goods, too many sizes, dimensions, grades, etc. Consequently, the profits on the items that sell well are eaten up by the carrying charges on those that don't move.

It will require courage to drop some of the items carried heretofore for "service sake," but many wholesalers and retailers in other lines are demonstrating they have such courage.

#### **Distributor cut stock by 50 per cent.**

We know of one hardware distributor who cut out 50 per cent of the items he carried as stock, 40 per cent of the territory he had tried to cover, 30 per cent of his accounts, and increased his net profits 35 per cent.

Our Department of Commerce, through its division of simplified practice, is helping material producers and distributors to cut out waste in their business through simplification and standardization of building materials and supplies. It will pay you to stock and sell the standard sizes, as they have been standardized on the basis of the sizes in most common demand or general use. They are the ones for which there is a constant call.

Let the man who must have special sizes, grades, etc., understand he can get them if he is willing to wait for delivery and to pay a price in proportion to their cost of production, and 7 times out of 10 he will find he can get the results he wants out of standard sizes already in stock. Selling the idea of simplified standard lines calls for an intimate knowledge of their advantages. The division has issued booklets on each recommendation promulgated and these can be ordered through the Superintendent of Documents.

Another source of better net profits in 1930 is found in the elimination of every kind of waste you find in your yards, shops, and offices. Close and careful management, use of labor-saving devices, reduction of accident hazards, improved illumination, use of electric power instead of man power, use of brain power instead of hand power, more leg work, and less sitting at the desk—all of these will help to make better business and better profits for you in 1930. One hundred dollars saved each month of the year is 6 per cent net on \$20,000 worth of new business.

### **FOLDING BOXES FOR COFFEE**

#### **Industry Interested in Promulgating Recommendation Covering Stock Sizes for Coffee Boxes**

Upon the joint request of the National Coffee Roasters Association and the Paperboard Industries Association, the division of simplified practice is assisting in the matter of determining the views of affected interests regarding a proposed simplification of sizes of folding boxes for coffee. The proposal has been regarded favorably by the membership of the National Coffee Roasters Association and the Paperboard Industries Association, respectively.

A preliminary study made by an official of the Paperboard Industries Association revealed the fact that there exists a great variety in the sizes and capacities of boxes now in use. The purely tentative suggestion has been made that two standard sizes might prove sufficient to take care of differences in bulk. It is thought the adoption of a simplified practice recommendation establishing stock sizes for coffee boxes would result in a reduction in production costs and in simpler inventory problem.

Greater convenience in handling, shipping, and storing are also listed among the potential benefits in such a program.



## PIONEER INDUSTRY IN SIMPLIFICATION MOVEMENT POINTS TO MANY BENEFICIAL RESULTS

**Paving-Brick Industry the First to Adopt Simplified Practice; Reduced Sizes and Varieties of Vitrified Paving Brick From 66 to 5; Article Was Submitted in Shaw Simplification Contest**

By STANLEY A. KNISELY

Perish the thought that in this article on simplification there is any desire to add one more to that multitude of epigrams that gathers dust on the walls of many executive offices. Too often do these epigrams clash with one another and their inconsistencies cause a dizziness that turns one's head.

The sales manager who prominently displays "This is my busy day" on his desk frequently tacks up about his sanctum numerous "sayings" which certainly invite the caller to loiter at least long enough to peruse them and extend the customary polite remarks concerning the extent of the collection.

To that executive, however, who at this late date has not as yet sensed the importance, to himself, his industry, and his country, of Elimination of Waste Through Simplification of Varieties and Standards, I might suggest the following "2-in-1" or combination epigram to be hung on the inner walls of his mental chamber.

"Excess sizes and varieties.  
Simplify, or you'll slip."

"Waste in industry  
Eliminate, or be eliminated."

A new business day is here. Industry, almost 'twixt dusk and dawn, has wiped out interest charges of millions of dollars by altering buying methods. Stocks on hand have been reduced to a minimum. Enormous amounts of capital are thus released for other purposes.

### Hand-to-mouth buying.

Hand-to-mouth buying is made possible through increased transportation facilities. The era of production has stepped back for the era of merchandising. Ten salesmen representing 10 different companies manufacturing practically the same product with the same standards of quality fight for the same job, and nine of the salesmen see the order handed to the tenth because the company he represents has undertaken to eliminate waste and simplify its product to a degree which has enabled it to quote a little lower price.

Possibly the most valuable of industry's many experiences during the World War, so far as its effect on subsequent peace-time policies is concerned, was that instituted by the conservation division of the War Industries Board in the elimination of industrial waste by simplification of varieties and standards.

With the experience of the War Industries Board as an encouragement, it was not long after he was appointed Secretary of the Department of Commerce that Herbert Hoover extended an invitation to industry to make use of any service his department could render to bring about reduction in the number of sizes and varieties of manufactured products as one contribution to the elimination of waste.

### Paving-brick industry participates.

The first to take advantage of this invitation was the vitrified paving brick industry through its national association. In the summer of 1921 a representative of the association called on the then Secretary of Commerce, now President Hoover, thanking him for his offer of assistance and requesting the magic

recipe or formula to be followed in bringing about simplification, something that had been talked about in the industry for years, and once attempted, with no results.

Secretary Hoover, in order to determine the industry's need for simplification inquired as to the number of different sizes and styles of paving brick then being manufactured. The association representative thought "at least 15 and possibly 20." Secretary Hoover then suggested a complete survey of the industry as the first necessary step. Questionnaires were sent to every manufacturer asking him to list the sizes and styles of all paving brick made and shipped by his company each year between 1914 and 1920.

Instead of the "15 or possibly 20" different sizes as at first thought, tabulation of the replies revealed that the industry was manufacturing 66 different sizes and styles of vitrified brick for the purpose of paving city streets and rural highways. First, there were the different styles current at that time. There was the repressed brick, the plain wire-cut brick, the brick with lugs, and the brick without lugs, those with bulged ends and those without, some with chamfered edges and other with plain edges. Second, the variations in size would have been humorous had the incidental waste not been so tragic. All manufactured for the self-same purpose, they ranged in length from 7 to 9 inches, in width from 2½ to 4 inches, and in depth from 2 to 5 inches, with differences sometimes of only one-eighth of an inch.

This story by Stanley A. Knisely, assistant secretary, National Paving Brick Manufacturers Association, was submitted by him in the recent Shaw simplification contest. It is the story of the development of Simplified Practice Recommendation No. 1. Since then more than 100 additional recommendations have been promulgated by industry under the auspices of the division of simplified practice of the Bureau of Standards. Detailed information on these recommendations may be had upon request to the division.



Just what result one-eighth of an inch in the width or length of a paving brick would have on its hardness, toughness, density, imperviousness, and general durability and serviceability is difficult to discover, in fact, quite impossible.

#### Department assistance sought.

Here then, was surely a fertile field for cultivation. It was fortunate that the United States Department of Commerce could start its program of simplification with an industry wherein the results were to be almost startling in their significance, because the department's report on this pioneer effort could not help but favorably impress the numerous other industries in need of similar treatment.

At this point it is well to point out that "simplification" is not something that is thrust down the throat of an industry by any form of governmental compulsion. Neither is it "standardization," a word which carries with it impressions that are sure to scare away the timid or suspicious executive. Simplification in this instance was a mutual effort on the part of producer and consumer, brought together through the kind offices of Secretary Hoover, to reduce the number of sizes and varieties of paving brick that were determined by both parties to be wastefully unnecessary.

In the case of the vitrified paving brick industry, the public engineer, through his specifications, constitutes the purchaser, although the taxpayer is the ultimate consumer and actually pays for the product. Therefore, representatives of the paving-brick industry met with representatives of the Department of Commerce, the Chamber of Commerce of the United States, and various governmental agencies in the first meeting on simplification of varieties and standards, on November 15, 1921.

#### Secretary speaks.

"While we currently assume that great advancement in living standards is brought about by new and basic invention," said Secretary Hoover at the first meeting, "an even larger field for advancement of the standards of living is found in the steady elimination of our economic waste. The waste due to unemployment during depressions, to speculation and overproduction during booms; to labor turnover and labor conflicts; to intermittent failure of transportation of supplies, of fuel, and power; to excessive seasonal operation; to lack of simplification and standardization in many of our commonly used commodities; to the loss in our processes and materials, all of these combine to represent a huge deduction from the goods and services we might all enjoy if we could but eliminate these wastes.

"To-day dozens of different sizes, styles, types, and patterns of the most commonplace articles are placed in the market by manufacturers who must possess special equipment and skill to produce these endless variations. The saving in national effort, through cooperation, as demonstrated by many well-known examples of simplification and standardization, runs into millions of dollars. The rate of our advance must be and will be in proportion to the extent in which we all cooperate for the elimination of waste."

#### Varieties reduced from 66 to 21.

At this first meeting the list of "recognized sizes and varieties of vitrified paving brick" was reduced

by mutual consent from 66 to 21 and a permanent committee was formed to carry on the work by meeting once each year, in March, to consider, on the basis of information contained in a newly made survey each year, the necessity for any addition to or further eliminations from the recognized list.

At the second meeting, held March 27, 1922, this list was reduced from 21 to 11, and at meetings held in March of 1923, 1924, 1925, and 1926 further eliminations were made until to-day the list of recognized sizes and varieties of vitrified brick numbers only five.

#### Beneficial results.

A survey of the beneficial results of this 5-year effort at simplification might be listed in a general way as follows:

*Production.*—Fewer varieties of stock on hand, less capital tied up in stagnant inventory, less money invested in idle machinery, more sustained periods of production on separate sizes resulting in fewer interruptions in manufacturing processes, and a consequent saving in time and money, reduced overhead, fewer and smaller stock piles of near-obsolete and slow-moving types and sizes for replacements, less valuable storage space needed.

*Distribution.*—Increased sales because of concentration on fewer types and sizes, and better delivery, taxpayers better satisfied.

*Consumption.*—Lower purchase price than otherwise possible, more uniform quality, better delivery service, streets torn up for shorter periods.

More specifically, that piece of machinery which determines two dimensions of a paving brick is the "die." Oil lubricated dies cost \$50. If a manufacturer in the bygone days wanted to manufacture the 66 different sizes and styles of paving brick he could have had several thousand dollars of capital tied up in dies alone. To-day the interest at 6 per cent on that amount of money will supply all the dies needed.

It takes two hours to change a die on a brick machine. Here was a tremendous loss sustained by the manufacturer who sought to compete with a neighboring plant by shaving an eighth of an inch from the length of a brick, or perchance adding it on in an effort to supply even 20 different sizes and styles.

#### Plants formerly forced to shut down.

There have been times in the past when paving-brick plants were forced to shut down because all available storage space was filled. These same plants, toward the end of the following summer paving season, might find themselves unable to fill their orders for certain sizes. Storage space around a paving-brick plant is worth too much money to have it partly filled with odds and ends of various sizes of brick, kept in stock to fill occasional orders.

Handling brick from kiln to stock pile and from stock pile to car is a costly operation. The shorter the distance they have to be moved and the fewer times they are handled the less waste and lower the cost.

Slowing up of production due to a confused mind on the part of workman as a result of having to "hack" one size or style of brick on the cars this morning and a different size or style this afternoon were costly delays. The same delays and confusion



were found in setting the brick in the kiln and in other departments. A possible annual saving to the Nation's taxpayers of more than \$2,000,000 is, perhaps, one of the most outstanding benefits of the simplification movement in this industry. Eliminating needless types and sizes of paving brick resulted in public engineers and manufacturers giving more thought to the necessary thickness of a paving brick. This thinking in turn resulted in many engineers experimenting with a thinner paving brick, namely, 2½ inches in thickness as compared with the 4-inch brick in general use.

#### Test on durability of brick.

Because of the wide interest shown in thinner brick and their increased use the United States Bureau of Public Roads undertook an extensive investigation of the durability of brick of various thicknesses, and in October, 1926, issued an official report to the effect that 2-inch brick were satisfactory for light traffic and 2½-inch brick for heavy traffic.

### AMERICAN MARINE STANDARDS COMMITTEE

#### Action of Board's Last Meeting on Certain Marine Standards Announced; Annual Election of Executive Board to be Announced in January

The annual election of the executive board of the American Marine Standards Committee was held last month, in accordance with the constitution and rules of the organization. The board-elect will hold its first meeting during the latter part of January.

The executive board elected for 1929 held its last meeting on November 16, and elected 12 new member bodies to membership. The membership is now 357. The board voted to revise the present marine standard specification for 2½-inch unlined linen fire hose, in order to make it conform to the present specifications of the Underwriters' Laboratories covering this kind of hose. The results of membership ballots on a number of proposed marine standards were reported, and were acted on as follows:

*Wire ropes for marine uses.*—The secretary was directed to prepare a final draft of specifications for submittal to the technical committee on "hull details" and on "ship operation details," the result of the procedure to be reported to the executive board at the next meeting.

*Sleeve couplings for propeller shafts.*—Proposed dual standards for solid and split sleeve couplings for the full range of sizes of propeller shafts for ships of the merchant marine were approved for promulgation.

*Mooring pipes.*—Favorable vote by the technical committee on "hull details" on proposed final drafts of standards for oval and circular mooring pipes was reported and the standards were approved for promulgation.

*Tubular metal berths for staterooms and staterooms.*—Proposed standards for shallow and deep berth frames, for installation as fixed or hinged standee berths, and in staterooms where metal berth frames would be suitable, also standard fittings for their installation, were tentatively approved for promulgation. Final drafts in which suggestions received from various sources are to be incorporated as far as they

The universal adoption of these sizes will result in a saving of more than \$2,000,000 a year, which saving must be passed on to the taxpayer because of the highly competitive conditions in the street and highway paving field.

Perhaps no paving-brick manufacturer can definitely state or accurately estimate the amount of money saving through a simplification in his industry, but, after all, isn't that the insidious thing about the past losses? Every paving-brick manufacturer to-day recognizes that these losses were prevalent in the past, that they ate into his profits, that they increased his cost, that they boosted his selling price, and that they had their effects all the way from the shale pit to the finished pavement and retirement, years later, of the paving bonds. These losses, however, were so hidden, so difficult to define, and so easy to lose track of that they were all the more dangerous, losses that were intangible but not at all insignificant.

They might be termed the "creeping paralysis" of industry.

can be correlated are to be subject to approval by the technical committee on "hull details" and on "ship operation details" before they are released for publication.

*Standard practice in hull construction.*—A preliminary draft of proposed standard general instructions was reported as approved by a substantial majority of the membership with, however, numerous suggestions for modification. It was decided that a revised draft should be prepared in which the suggestions received shall be incorporated as far as they can be correlated; that such draft shall be submitted to the principal critics, to the National Council of American Shipbuilders, and to the technical committee on "hull details," the results to be reported to the executive board at a future meeting.

### PACKING EGGS IN BOXES

#### Increasing Use of Boxes and Cartons in Retailing Foodstuffs in Great Britain

The growing tendency to sell various commodities, more specially foodstuffs, in packages and boxes is stimulating the demand for paper containers of all sorts in Great Britain, according to a recent report received by the Department of Commerce from Consul General Halstead, at London, England.

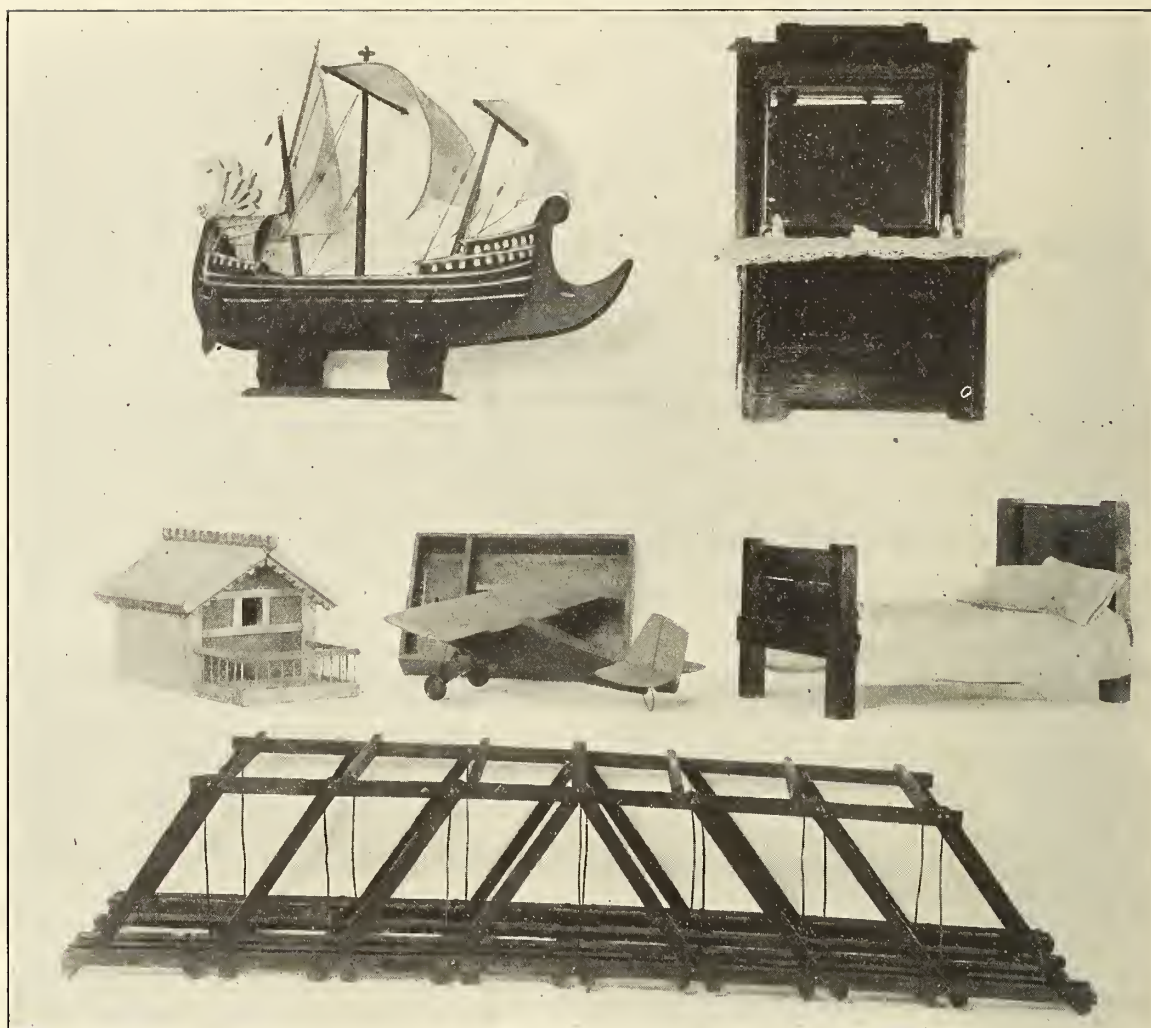
The present system of egg marking has influenced that tendency. Many dairies and groceries which formerly displayed eggs in baskets and boxes but retailed them in paper bags are now displaying and selling eggs in paper boxes of various types. Those packers whose eggs meet the national standards of weight are at present authorized to pack eggs in either retail cartons or wholesale cases on which is stamped the Government mark of approval. The wholesale case now in general use consists of a box divided into two sections containing layers of 36 eggs each.

The most favored retail cartons are doubled-boat shape. The types of container for eggs is not governed by law, there existing freedom of choice in that respect.



## THEY MADE IT

How Waste Wood is Being Utilized



Approximately 1,500 boys and girls answered roll call in a "You-can-make-it" woodcraft contest recently staged by a Washington, D. C., newspaper, in cooperation with the playgrounds of that city. The contest grew out of the suggestions for making interesting and useful articles out of secondhand boxes and

crates and scrap lumber, contained in the booklet "You Can Make It," issued by the National Committee on Wood Utilization, of the Department of Commerce. This booklet was used by those enrolled in the contest. The above illustration shows a few of the prize-winning articles in the Washington contest.

### PIPE FLANGES AND FLANGED FITTINGS

**American Standard for Cast Iron Pipe Flanges and Flanged Fittings Proposed; American Standards Association Has Proposal Under Study**

The Heating and Piping Contractors National Association, the Manufacturers Standardization Society of the Valve and Fittings Industry, and the American Society of Mechanical Engineers, joint sponsors for the American Standards Association sectional committee on Cast Iron Pipe Flanges and Flanged Fittings, are considering for submittal to the A. S. A., a draft of the proposed American Standard for cast iron pipe flanges and flanged fittings for maximum nonshock working hydraulic pressure of 800 pounds

per square inch (gage) at ordinary air temperatures. The sectional committee which prepared the standard is under the chairmanship of Collins P. Bliss, assistant dean of the College of Engineering, New York University.

One of the provisions of the proposed standard is that all fittings shall be clearly marked with (a) the manufacturer's name or trade-mark, (b) the figures 800 indicating the maximum working pressure for which the fittings are intended, (c) the letters CI, indicating the material of which the fitting is made, and (d) the letters WOG, indicating that the fitting is intended for use in water, oil, or gas piping systems. Elbow, 45° elbow, tee, cross, 45° lateral, and reducer fittings are covered in the standard.



## INDUSTRIAL FIRE LOSS SAID TO BE HIGH

**Fire Losses Affect Natural and Created Resources of Nation; Industrial Fires Said to Occur Usually in Larger Buildings; Bureau of Standards Conducts Many Tests on Fire Resistance of Materials and Their Fire hazard.**

The loss to commerce and industry from fire constitutes a serious drain on the natural and created resources on which their activity depends. Of the yearly property loss from fire of approximately less than \$500,000,000, a large part is attributable to relatively few fires, each involving a large loss. Such fires occur mainly in manufacturing mercantile and storage occupancies with relatively large buildings, and building areas and high concentration of value of contents.

In addition to the property loss as such, there is a further effective loss from fire consisting of cost of fire protection and extinguishment, cost of insurance, and loss of production and time of workers where fires have occurred. These together constitute an economic loss greater than the property loss itself. In many cities the cost of fire departments and fire protection equals or exceeds the property loss from fire. The seriousness of the disturbance of fires to normal functioning of commercial and industrial establishments is attested by the fact that in spite of insurance coverage, a considerable percentage of those suffering total or high loss from fire do not again resume operations.

### **Building design important.**

While a number of requirements need to be observed in order to secure the proper degree of fire safety in industrial establishments, it will invariably be found that at least for the prevention of large losses the design and exterior and interior appointments of the buildings concerned are important. Fire resistance inherent in the building itself is largely independent of the human element on which fire prevention along many other lines must depend.

Even fire-detecting and fire-extinguishing appliances depend on proper maintenance for their effectiveness. Fire resistance incorporated in the structural elements loses little in effectiveness as long as the building serves the purpose for which it was built.

On account of the large prospective gain in fire safety from improvement in structural conditions, the fire-resistance activities of the Bureau of Standards have been concerned mainly with the fire resistance of materials and members entering into the construction of building, the severity of fires that can result with given amounts of combustible building contents, and the protection afforded by devices, such as insulated record containers. Some work has also been done on the fire hazard of materials constituting the contents of buildings from the standpoint of susceptibility to spontaneous ignition or explosive effects.

### **Furnace-fire test used.**

In the standard fire-resistance test, the material, construction, or device is subjected to a furnace fire, the intensity of which is controlled so that given average temperatures obtain in the furnace chamber at stated times after the fire is started. The other test conditions will vary with the type of construction or device to be tested.

Thus, columns in a building are required to support a load approximating that for which they are designed. Floor constructions and bearing walls are similarly required to support load and also to afford resistance to flame and temperature penetration to an extent that will prevent ignition of materials in contact with the unexposed side.

Incombustible finishes must serve similarly in preventing ignition of the material or construction protected and insulated containers must preserve their contents. The fire resistance of the material, construction, or device tested is measured by the number of hours and minutes during which these requirements are met in the fire test. Ability to withstand the erosion from hose streams such as are applied in fire extinguishment is also required for walls, floors, and partitions.

Some of the first experimental work conducted by the bureau, in cooperation with other organizations interested, was on building columns. As subjected to fire, these members are important in maintaining the integrity of the structure and preventing collapse that would induce spread of fire not only within the building concerned, but also to neighboring buildings.

Among the interesting facts uncovered in these tests was that in which it was found that wood columns with metal caps and connections to the floor beams fail first, not from weakening of the column itself, but from softening of the wood next to the metal cap, causing slipping of the column on its bearing. By substituting Portland cement concrete for metal as material for the caps, the fire resistance of the column was nearly doubled. The fire resistance of bare steel columns was increased from 20 minutes or less, to from one and three-fourths to over seven hours, by the application of a 2-inch thick covering of concrete.

The fire resistance of nominally similar coverings was found to vary greatly, due, in the case of concrete given above, to differences in the mineral composition of the sand, pebbles, or broken stone with which the cement was mixed. In another series of fire tests with concrete columns, it was shown that a large improvement in the fire resistance of concrete made with aggregates having mineral composition that induce cracking and spalling as exposed to fire can be obtained by placing metal mesh near the surface of the concrete or by applying protection to the concrete, such as plaster.

### **Importance of masonry walls.**

Masonry walls are important in protecting against fires in neighboring buildings, restricting spread of fires within the building, and also in confining the fire so that it will not constitute too severe a hazard to adjacent construction. While fire walls of brick have long been recognized as valuable aids in restricting the spread of fire no quantitative measurement of the protection afforded had been made until walls comparable in size to those built between floors in



buildings were subjected to fire tests in the bureau's furnaces.

As subjected to the standard furnace exposure on one side, fire-resistance periods from one hour for the 4-inch thick partition to nine hours or more for solid walls 12 inches thick were developed. Several types of hollow brick walls were also tested as also more than 200 walls from 8 to 16 inches in thickness built of hollow clay tile, that gave a comparable range in fire resistance. Fire tests of light interior plaster partitions also indicated properties valuable in restricting the spread of fire with proper choice of materials and design.

Other constructions and materials whose fire-resistive properties have been determined include theater proscenium curtains, designed to shut off the stage from the auditorium in case of fire, and the whole range of prepared roofing materials in general use.

#### Utilize buildings in testing operations.

Having determined the fire-resistive values of building members and materials in terms of the time they withstand the fire test, the information needed in order to apply them with economy and safety as protection against fires that may arise in buildings, includes knowledge of the severity of such fires.

The combustible contents of commercial buildings range from less than 10 pounds per square foot for light office occupancy to 60 or more pounds per square

foot for some mercantile and storage buildings, assuming the contents to be distributed uniformly over the whole room area. To obtain information on the temperature and duration of fires that can occur under these varied conditions, two fire resistive 1-story brick and concrete buildings were built and outfitted with discarded furniture and other contents to simulate some of the occupancies concerned.

These were burned out several times and the temperatures in all portions of the buildings measured from the time the fires were started until the ruins cooled down. By comparing the temperature and duration of these fires with that of the standard furnace test, it is possible to form a fair estimate of the equivalent severity of fires that can occur in fire-resistive buildings with given amounts of combustible contents.

Thus, fires where the combustibles averaged 15 pounds per square foot gave a fire severity equivalent approximately to the first one and one-half hours of the furnace test, and for combustible contents of 50 pounds per square foot the fire severity was about equivalent to the first six hours of the same test.

With the help of the information developed by these furnace tests and fire-severity tests, it will be possible to apply materials, constructions, and devices as protection against fire with as great a degree of assurance and economy as they have been applied for other structural purposes.

## PRESERVATION OF LUMBER

### Value of Chemically Treating Lumber to Protect it from Decay or the Attack of Insects Summarized

The value of using, for industrial purposes, wood which has been chemically treated to protect it from decay or the attack of insects has been conclusively established, according to the National Committee on Wood Utilization.

For many years those in the building and construction field have felt that there is a definite need for preserved wood in this field. To meet this need the committee has started a movement to make chemically-treated wood, heretofore obtainable only in wholesale quantities or not at all, available to the small consumer, the builder, and the contractor, in the State of Ohio. Architects, engineers, builders, lumbermen, and wood conservationists are cooperating in this movement which is expected to spread to other States in the near future.

One of the things this movement has emphasized is the necessity for the adoption of standard sizes of preserved wood adapted to small-construction purposes, that can be carried by retail lumber yards as stock.

After an extended study of the sizes of lumber most frequently demanded by the building trade, the committee has formulated a set of sizes which it believes could be used as standard in the production and sale of preserved wood. It is pointed out by the committee that the adoption of such standard sizes would be of inestimable value to the consumer and the retailer, since it would eliminate the confusion now existing in sizes and grades of preserved lumber, and the additional expense resulting from storing and han-

dling a great variety of sizes, many of which are used infrequently.

It is practically impossible to give a list of specific sizes of treated lumber that would answer all purposes. The committee's list is purely suggestive and includes such sizes as 2 by 4's; 2 by 6's; and other stock of more frequently used widths and lengths. If the list does nothing more than form a basis upon which a system of standardized sizes of preserved wood may eventually be established, it will have accomplished its purpose.

## HOLLOW BUILDING TILE

### Survey of Hollow Building Tile Production for 1928 Shows 89 Per Cent Adherence to Simplified-Practice Recommendation

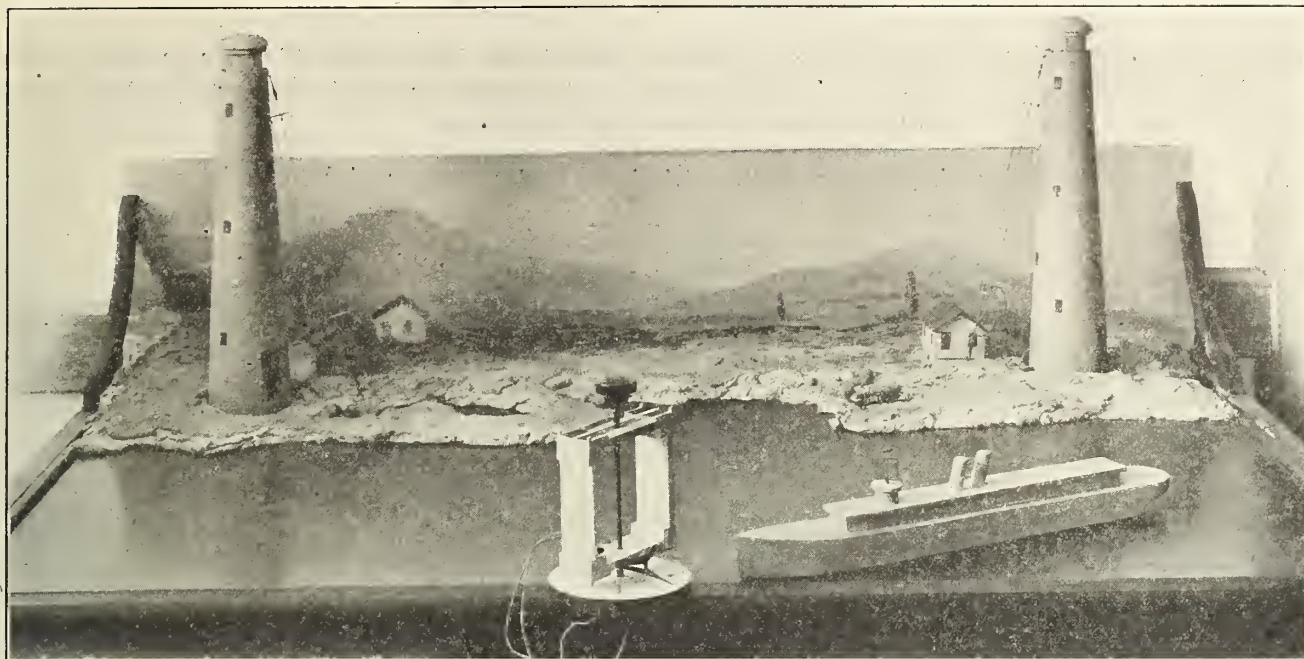
Periodic surveys of production are conducted by the various standing committees of effected simplified practice recommendations, through the cooperation of the division of simplified practice, to determine the degree of adherence which the industries are according simplified practice.

One such survey, recently conducted by the standing committee for Simplified Practice Recommendation No. 12, Hollow Building Tile, indicated that 89.54 per cent of the 1928 production of hollow building tile conformed to the items listed in the recommendation. This simplification, which reduced the variety in sizes and styles of this commodity from 36 to 20, was originally developed by the industry in 1924.

Many constructive suggestions as to the possible strengthening of the recommendation were also received. This comment will be given full consideration by the members of the standing committee of the recommendation at the next revision meeting.



## GUIDING SHIPS AT SEA



Model illustrating use of radio-direction finder first developed by Bureau of Standards.

Each lighthouse pictured sends a radiobeacon signal which penetrates the fog as easily as clear air. The coil on the frame in the foreground simulates the direction finder used aboard ship; as oriented, it gives zero signal from the lighthouse at the left. The pointer shows the direction of signal. A similar bearing is

found for the lighthouse on the right. The intersection of these lines laid off on a map marks the exact location of the ship on which the direction finder is located.

Sixty-six such radiobeacons are in active daily use of the waterways of the United States, and about 1,100 United States ships and 2,000 ships of other than the United States have radio-direction finders for the use of the beacon signals.

## DRESS PATTERNS

Printed Pamphlet for Commercial Standard on Dress Patterns Now on Sale

The printed pamphlet entitled "Dress Patterns, Commercial Standard, CS13-30," has been released and may now be purchased from the Superintendent of Documents, Government Printing Office, according to an announcement of the division of trade standards, which states that the standard represents a coordinated effort to clarify the classifications, terminology, the size designations, and corresponding body measurements used as a basis for laying out commercial dress patterns to be sold through dry goods and department stores for home use.

Contrary to what may be a natural inference, it is in no sense an attempt to set up dimensions for either perfect or average figures. It is rather a practical compromise between the average of anthropometric measurements from various sources, the experience of dress-pattern manufacturers and their commercial practice, and provides a system of body measurements by which the individual may determine the correct size of pattern to be purchased, bearing in mind that final fit is established by adjustments to suit the individual.

Heretofore the various dress pattern manufacturers each had classifications and size systems of their own which were confusing to the merchant and to the

user of dress patterns. The hip measurement, for instance, was taken at locations varying from 5 to 9 inches below the natural waist line. According to the commercial standard, the industry now proposes to locate the hip measurement at 7 inches below the natural waist line in order that the pattern users may determine, before cutting into the goods, the allowance for adjustments which will be necessary to produce a proper fit.

For ladies, the bust, waist, and hip dimensions are the only measurements given. For misses and juniors, four measurements are given in addition to the size designation, namely, bust, waist, hip, and socket bone to floor, the latter measurement being taken while the individual is wearing shoes. For girls, children, boys, little boys, and infants, the size (formerly age) will correspond to a definite measurement for the breast, waist, and socket bone to floor. For boys' garments, a neck measurement is also included. For purposes of uniformity in determining the yardage of material required to make a given garment, and for pattern layouts, the following widths of material are recognized as standard; 27, 32, 35, 39, and 54.

The commercial standard was effective for new production of dress patterns beginning January 1, 1930. As stated, copies of the pamphlet may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at a cost of 5 cents per copy.



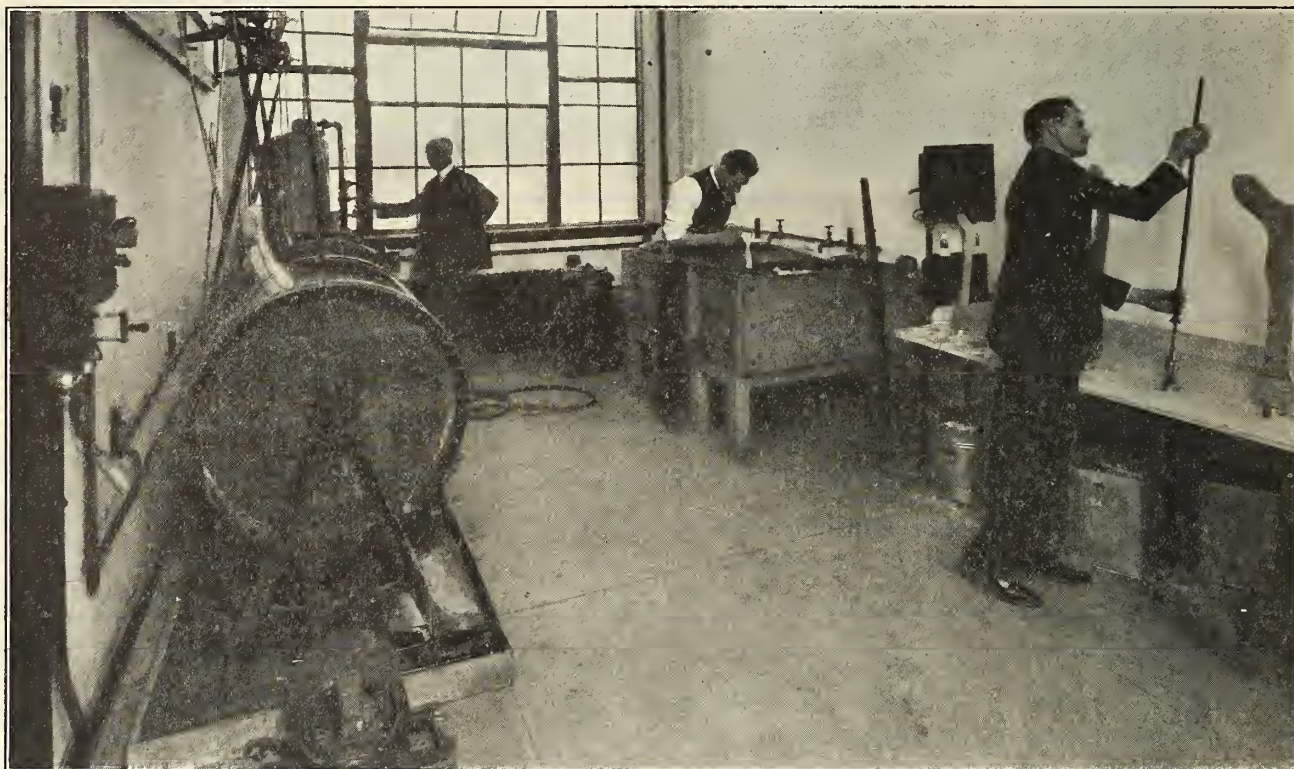
## LAUNDRY PROCESSES IMPROVED BY STUDIES OF EFFECTS OF CLEANING AGENTS AND METHODS

**Soap an Index of Civilization Says Writer on Laundry Operations; Bureau Has Circular on Soap; Bureau Aided in Developing Stoddard Solvent; Silks Deteriorate Rapidly in Light; Research Discovers Cause of "Winter Damage" to Textile Goods Laundered in Wintertime**

By HENRY D. HUBBARD, *Assistant to the Director, Bureau of Standards*

The National Bureau of Standards is technically concerned with the "refreshment" of clothing, the new word for laundry processes which restore garments to wholesome cleanliness important for hygiene, good appearance, and garment conservation. "Refreshment" includes removal of stain spots, restoration of the nap and "feel," bleaching, ironing, to restore the fabrics to initial freshness. The bureau's

seven groups adequate to classify soaps by their service function. A discussion of the composition of each group is given, and the circular is a document full of information. A revision has just been completed and will soon be sent to press. A discussion of composition, ingredients, and specifications is given which became the basis for the Federal specifications for soap for Government use.



*Laundry room at bureau in which practical laundering tests are made*

well-equipped laundry research laboratory undertakes the experimental search for cleaning agents for any stain on any fabric. A great machine industry has developed from the old home industry—the family wash.

Soap is an index of civilization. We extol its virtues in print by ad and text, by radio, in school; everywhere the cult of cleanliness is becoming almost a sacrament. A new stage appears when science enters the field. Each ingredient and process detail must qualitatively and quantitatively justify itself.

### **Circular on soap.**

The Bureau of Standards Circular on "soap" (available by purchase only) outlines manufacturing processes, and, from the countless varieties, found

Other cleansing agents are described in brief in the well-known Circular 70, *Materials for the Household* (available by purchase only), issued by the bureau for households and teachers and students in domestic science.

By act of Congress research facilities of the Government may be made available to qualified workers. Under this act the Bureau of Standards research associate system was established, and its marked success is a notable example of the bureau's cooperation with industry on its basic problems.

The bureau's unique research equipment in some 70 specialized sections is made available for industries which have no research laboratories and to supplement those which have already some provision for research. The researches are usually planned jointly by



the bureau and the technical committee of the entire industry.

#### **Appoints research associate.**

When the National Association of Dyers and Cleaners expressed the desire for such cooperative research in a systematic program the Director of the Bureau appointed a technical expert of the industry as research associate, maintained by the industry but working under the supervision of the bureau experts and administration.

There resulted from the work of this associate a reference book of the cleaning art, compiled with the full cooperation of bureau experts; a series of short-term schools for managers and foremen in various

determination of the limiting amounts of highly volatile gasoline, thus minimizing hazard, and by determining the limits of the nonvolatile oily constituents, thus minimizing the grease remaining in the garment after dry cleaning. Methods of inspection and test were worked out to insure efficiency and safety, and the new Stoddard solvent is now being produced by various manufacturers. The name is from a leading industrial expert who was active in developing its use.

#### **Adopting commercial standards.**

The Bureau of Standards used its good offices through the procedure for adopting commercial standards with success, so that the cleaning industry has



*Chemical laboratory at bureau in which work on dry-cleaning soaps is carried out*

parts of the country on the latest advances in the cleaning art; and eventually a special research laboratory built for the industry, near Washington, and designed to work in close harmony with the Bureau of Standards.

#### **Dry cleaning avoids shrinkage.**

Dry cleaning—by the use of organic solvents—avoids shrinkage caused by water washing and involves less rubbing. The disadvantages, until recently, were the explosion hazard and the grease remaining in the garment. The machines are now gas-tight and electrically grounded to avoid explosions from static sparks. So gas-tight are modern plants that the air is as sweet as in any other type of building.

The Bureau of Standards aided notably in the development of the Stoddard solvent by experimental

adopted the specifications as a national commercial standard for the industry.

An excellent type of research was the reclamation of dry-cleaning gasoline. At the time 45,000,000 gallons were being used annually—clearly an item worth saving. After a study of methods proposed and in use, a modified method was developed in detail to save the gasoline otherwise lost by evaporation or wasted by lack of means to purify it. The research associate, with the cooperation of other members of the staff, brought the research to such success that the reported annual saving to the industry touches the seventh figure.

#### **Dyes not affected.**

The bureau found that most dyes are not affected by dry-cleaning solvents. To minimize the effect on



susceptible dyes, it was found that the cleaning agent should be water free and neutral; that is, not alkaline. Substitutes for susceptible dyes are being sought. A large number of different dyes were tried on a variety of fabric, cotton, silk, rayon, and wool and the effect was found nil. This gives greater assurance to the public that dry cleaning will not injure delicately dyed garments.

It was found that silks deteriorate in light more rapidly when weighted with tin (absorbed by the silk fibers as a salt tin). At times they completely disintegrate. Dry cleaning, after investigation, was acquitted as not guilty of the damage. Hence, the cleaner is justified in not assuming the risk, since he does not and can not easily learn the previous history of the garment. It was disclosed that garments which appear to be in good condition when they arrived at the cleaners may on coming out collapse into a powder when handled. The damage to silk caused by light was found to be greater when the silk was wet with perspiration. A research is in progress on the effect of diffused light indoors on unweighted silks and on silks variously weighted, since it is already known that excessively weighted silks lose strength faster in sunlight.

#### Uses oil in cleaning.

Many garments having fur and leather trim are dry cleaned. Such trim is filled with oil to make it pliable. The solvent used in cleaning dissolves out the oily finish material, leaving the fur or leather brittle.

The Bureau of Standards workers developed a means to avoid such damages. By adding paraffin, the "fat liquor" so essential to pliability, is kept intact and the appearance and in some cases the luster is improved. The addition of naphtha prevents attack by organisms and furnishes a cheap colorless material which does not discolor nor become rancid. The research gave the answer to the gain of the industry and the public.

### CORN BROOMS FOR HOUSEHOLD USE

#### Preliminary Conference Scheduled for February to Consider a Proposal for Commercial Standard Covering Corn Brooms for Household Use

A preliminary conference of a limited number of manufacturers held at the Bureau of Standards on November 25 voted to request the assistance of the bureau in the establishment of a commercial standard for corn brooms, according to the division of trade standards. In general, it is proposed to set up a description of four grades of corn brooms for household use as a basis for marketing.

It is proposed by the industry that each broom shall bear a manufacturer's label guaranteeing conformity to a stated grade or quality. Each grade will be based upon a definition of the quality of the broomcorn, the quality of the handle, and general requirements covering workmanship, twine, and wire used. The preliminary proposal covers five sizes in four grades and gives the dry weight of the complete broom, the length from shoulder to sweeping face, in inches, for each size, as well as the total number of ties and

Performance tests of a liquid laundry soap in washing textile materials were published, giving the peculiar merits of the soap: Less shrinkage in washing in some classes of fabric, less injury from repeated washings, better "feel," slighter change of color, greater resilience in washed wool tops, and better scouring and enhanced whiteness on fine-grade wool fleece.

#### Winter damage.

A typical research is the discovery of the cause of the so-called "winter damage" to textile goods laundered in the wintertime. It was found that the damaged goods always contained sulphuric acid and had been washed and dried out of doors. Atmospheric sulphur dioxide from winter fires became suspected as the offender.

The decisive test proved this to be the active cause. This test was to wash a number of towels repeatedly outdoors and iron them by hand. These lost breaking strength faster than when washed and ironed in the laundry. This loss in breaking strength was then duplicated by exposing damp towels to air containing one-millionth sulphur dioxide. The chain complete, it was found that the sulphuric acid formed in the damp fabric was notably active at the temperature of the hot iron used in ironing the towels. The remedy devised was to produce calcium bicarbonate in the final rinse—an alkali which is a natural neutralizing agent for acid. The remedial process has been used in New England laundries with great success in minimizing the "winter damage."

#### Eliminates prespotting.

On the program of the bureau for cleaning research is the elimination of prespotting. At present each spot must be removed by an appropriate reagent. It is hoped to introduce into the cleaning bath such suitable reagents as will remove the necessity of individual handling of garments and the prespotting of the individual stains. This is a look ahead full of promise for successful research.

the minimum number of stitches in the first and last tie.

It is expected that the proposal will be brought to the attention of all of the broom manufacturers in America prior to a second preliminary conference to be held the latter part of January or some time in February, and following a consensus of opinion among the producers the proposed draft will be submitted to distributors and consumers as well as general interests at a later conference for comment and approval.

### COMPANY TO USE PRICE TAG OF STANDARD SIZE

General Motors Corporation, through national advertising and through all its dealers, has announced that a new standard price tag, attached to the steering wheel of every General Motors car offered for sale, shows the list price of the automobile with an addition for freight and delivery charges at the "delivered price," to which a further addition covering accessories and special equipment is made, thus giving the "total delivered price."



## REFRIGERATOR SPECIFICATIONS

### American Standards Association Considering Standards and Performance Specifications for Domestic Ice Refrigerator

The provision of a sufficient amount of usable space for storage of perishable foods at satisfactory temperatures is one of the aims of the American Standards Association sectional committee on specifications for refrigerators, according to a report recently submitted by Dr. Louis Stanley, chief of the Bureau of Home Economics, United States Department of Agriculture, who is chairman of the subcommittee on "user's requirements."

In outlining the requirements of the housewife, the report stated that "a portion of the box must maintain a temperature of 45° or below, for storage of milk and more perishable foods, and any portion used for food storage should be within 10° of this temperature. The amount of space required will vary with size and needs of family and amount of entertaining done. Refrigerator sizes should be designated in terms of usable space as well as ice capacity."

#### Other needs listed.

Other refrigerator requirements of the housewife as outlined in the report are: Economy of operation which depends upon an ice compartment adapted to the size of ice cake which is recommended for cooling the box, satisfactory insulation, durability, and continuing efficiency of operation (depending upon the insulation being either rigidly fitted or cemented in place, and nonwarping construction); ease of care, which requires nonabsorbent lining, easily cleaned, with rounded corners and every portion visible. The underneath portion should be accessible for cleaning and draining if necessary. It should be sufficiently well ventilated to prevent accumulation of moisture and any molding or decay of wood.

A further requirement is convenient arrangement; that is, the cabinet should be sufficiently high from the floor so that the bottom shelf can be reached easily, and the shelves should be conveniently spaced for the articles to be stored thereon.

#### Outline of primary agreement.

The report outlines, as the primary agreement on which the work of the committee is based, the following: "Any standardization of refrigerators must be approached from two points of view: First, structural facts, including size and arrangement in relation to ice capacity, stability, and selection of material and finish; and second, from the point of view of performance.

"This committee recognizes that it is concerned with structural facts only as they affect performance, convenience of use, and care. They will not attempt to set these up in any detail, but will hand over to another committee a statement of the factors which are considered important, believing it to be the function of the second committee to indicate which of these are practical and how they can be safeguarded in refrigerator manufacture."

It has been tentatively agreed that different dimensional standards would be necessary for the ice and mechanically operated boxes, and that cabinets for use with ice should be studied first.

The Bureau of Home Economics and the American Society of Refrigerating Engineers are joint sponsors

for the ASA project on standards and specifications for refrigerators.

## DRAWING AND DRAFTING ROOM PRACTICE

### Standards for Methods of Indicating Bolt Heads, Nuts, and Screw Threads, and Dimensions Sent Out for Criticism by American Standards Association

Standards for methods of indicating dimensions and for methods of indicating bolt heads, nuts, and screw threads, are being circulated for criticism by the American Standards Association sectional committee on drawings and drafting room practice, which is under the joint sponsorship of the Society for the Promotion of Engineering Education, and the American Society of Mechanical Engineers.

"In developing the proposal, the committee has retained the two methods now commonly used to indicate screw threads," said S. Ketchum, chairman of subcommittee on "line work," in submitting the draft of the proposed American Recommended Practice on Bolt Heads, Nuts, and Screw Threads.

"It, however, has not recommended the use of the right and left slant lines for indicating right and left hand threads, since it believes that where the latter method was adopted, the direction of the slanted line alone was not trusted, but a note was always added when the left-hand thread was required. The end view of a threaded screw is conventional, whether a dotted circle or a part of a circle is used. The committee's suggestion for indicating the end view of a screw thread by two full circles, dotted if invisible, works well for assemblies and picture drawings.

#### Alternate method.

"An alternate method of newer conventions for representing screw threads which more closely resembles the German standard practice and is in line with the recently issued British standard on this subject, is also proposed for criticism and comment.

"For large size screw threads a pictorial method is recommended to fill an occasional requirement. A convenient method of drawing bolt heads and nuts is also advanced in this proposal. This method indicates the proportions of the new American standard bolts and nuts, and is sufficient for most cases."

#### Methods of indicating dimensions.

The draft on "methods of indicating dimensions" gives illustrations of both recommended and non-recommended methods of indicating dimensions. E. B. Neil, manager, research department, Automotive Industries, is chairman of the subcommittee which developed this draft.

"All drawings must be so dimensioned that the parts shown thereon can be manufactured or made without having to scale the drawing or make any calculation to obtain any needed dimensions. Dimensions must not be duplicated in various views of a single part, and only a sufficient number to make it possible to produce the part shall be given and no more, except that in some cases over-all dimensions may be given in addition to detail dimensions on structural and large parts. However, this is recommended only for checking purposes. All dimension lines and their corresponding figures shall be placed so that they may be read from the bottom and right-hand edge of the drawing," the draft states in part.



## HOSPITALS INTERESTED IN STANDARDIZATION

**Hospitals Buy Many Staple Articles Susceptible of Standardization; Would Mean More Economical Purchases; Educational Buyer Reviews Subject in Detail**

It is estimated that the hospitals of the United States, which represent approximately \$4,500,000,000 of invested capital, spend more than \$100,000,000 annually in the purchase of various hospital supplies. In considering this statement there comes to the most inexperienced buyer visualization of tremendous possibilities for standardization of supplies most commonly used by hospitals throughout the country, as well as economic management and control of public money which is being spent in the purchase of hospital supplies for medical care and treatment.

Among the many items purchased by hospitals are numerous commodities of common consumption, including gauze (in all forms), cotton and cotton fabrics, linen, adhesives, silverware, chinaware, glassware cleaning and soap powders, toilet paper, paper towels, enamelware, rubber sundries, printing, luer syringes, liquid soap, lysol, mops, and safety pins. Many of these items and others which could well be added to the list could be purchased in the group plan to the greatest advantage in savings and with the least amount of research to determine standardization.

### Educational buyer reviews subject.

On the subject of standardizing hospital purchases, the hospital section of the "Educational Buyer," propounds some very interesting questions relative to the standardization of supplies used by the hospitals. Must there be so many sizes in mesh of gauze, so many sizes in the bandages made from this gauze, and are the individually wrapped bandages the most satisfactory and economical method of packing? Must we have so many different qualities and prices of cotton, packed under various labels in 1 and 5 pound rolls? Is it necessary that the manufacturer of linens have such an extensive table of linen sizes and qualities?

Naturally, under such circumstances there are many various prices, brands, and trade names. It is necessary for the hospital supply house to offer such a variety of sizes in enamelware and further, allow one to choose from American, Swedish, Austrian, and other makes of these products? If certain sizes and qualities of the various rubber goods were to be listed as "no longer manufactured" would hospital service suffer? Is it to anyone's advantage that luer syringes vary from an almost useless item to a very fine product? Can we conscientiously argue for the cause of "the cost of medical care" when a superintendent requires one form of printing for medical records while his neighbor superintendent wants entirely different forms, quality, and size?

Hotels, railroads, public utilities, and many other organizations, whose volumes of business merit it, are engaged in group purchasing. Many items used in hospitals are common to hotels and other concerns wherein there lies possibilities of merging in buying certain items.

### Standardization means savings.

There is no doubt that standardization of hospital supplies and proper management in the purchase of such commodities as are commonly used by hospitals

can have a far-reaching effect with respect to savings of public money. A practical solution to the many problems which now seem to confront hospitals throughout the country is to enlist the aid of the manufacturer, producer, or selling body. The manufacturer could reduce his overhead cost by producing fewer articles and more volume, thus lessening his detail, and also reduce the cost of individual packing. Estimates of future purchases should be given to the manufacturer in order that he may operate his plant at a steady point of production every month of the year.

Aside from the question of savings in dollars and cents there are certain other advantages which hospitals may derive by means of standardization. Every hospital of the group would be using quality items at a more reasonable price than formerly paid for inferior quality. It would render improved service to the consumer by a more prompt delivery of the goods ordered. And, finally, it would bring about much saving in time to the purchasing department.

## WALL PAPER STANDARDS

### Commercial Standard for Wall Paper Available by Purchase

The printed edition of the commercial standard specifications and tests for wall paper has been released in the form of a booklet entitled "Wall Paper, Commercial Standard, CS16—29," according to the division of trade standards. The booklet sets forth the minimum quality requirements for serviceable wall papers and establishes standard sizes and weights.

The requirement of color fastness, together with adequate tests for its destination, is one of the important features of the standard specification. Grounding, or coating, weight of stock for embossed papers, and the manner of printing, are among other points covered.

When wall paper is made according to the commercial standard, manufacturers may so label their products. The Wallpaper Association of the United States of America has adopted a copyrighted label which their members are to use on all papers conforming to the standard. The label, which will appear on the back of wall paper samples, reads as follows:

This wall paper guaranteed to meet all requirements as specified by United States Department of Commerce, Wall Paper, Commercial Standard CS16—29.

An abbreviated form of this guarantee may also appear on the selvage of the paper. This label should soon become the guide post to the purchaser of wall paper, giving assurance of satisfactory service and providing a basis for reestablishing consumer confidence in this important decorative material.

## COMMERCIAL STANDARD FOR FELDSPAR PROPOSED

### Proposal Would Establish Standard Specification for Grades of Ground Feldspar; Widely Used in Ceramic Industry

As a result of the misunderstanding and confusion that has attended the buying and selling of ground feldspar, the division of trade standards has been requested by the Feldspar Grinders' Institute to cooper-



ate in the establishment of a standard classification for grades. Feldspar is used quite generally throughout the ceramic industry as an important component in the manufacture of porcelain dinner ware, pottery, electrical porcelain, enamelware, floor and wall tile, vitreous china, plate, and other kinds of glass.

It is one of the most valuable materials entering into the manufacture of the above-named products, and until recently, it has been bought and sold on rather loose designations. Because of consequent losses of time and money through misunderstandings, the producers, through their trade organization, the Feldspar Grinders' Institute, have, in cooperation with the Bureau of Standards, evolved a proposed commercial standard which was submitted to all interested organizations for comment at a general conference held in January under the auspices of the bureau.

### **SIMPLIFICATION FOR COPPER RANGE BOILERS PROPOSED**

A preliminary conference of manufacturers of copper range boilers was recently held in Boston, Mass., to consider a proposed simplification program covering copper range boilers. Following a discussion on the subject, a questionnaire was drafted to circulate among the industry to obtain information upon which to base a simplified practice recommendation. It is expected that the replies to the questionnaire will be in the hands of the simplified practice committee of the industry within a short time.

### **ICE-CREAM CARTONS AND MOLDS**

#### **General Conference Approves Proposed Recommendation for Sizes of Ice-Cream Cartons and Molds**

A simplified schedule of sizes of ice-cream cartons and molds was approved by a general conference of all interests, meeting in December, 1929, under the auspices of the division of simplified practice.

The proposed list of sizes of machine-filled cartons is as follows: U. S. Standard No. 1 pint,  $3\frac{3}{16}$  by  $3\frac{1}{2}$  by  $2\frac{1}{16}$  inches; U. S. Standard No. 2 pint,  $2\frac{7}{16}$  by  $3\frac{1}{8}$  by  $3\frac{1}{16}$  inches; U. S. Standard No. 1 quart,  $2\frac{1}{16}$  by  $3\frac{1}{2}$  by  $6\frac{1}{4}$  inches; U. S. Standard No. 2 quart,  $2\frac{7}{16}$  by  $3\frac{1}{8}$  by  $7\frac{3}{4}$  inches. The dimensions of the suggested standard 2-gallon ice cream mold are 26 by  $6\frac{1}{4}$  by  $27\frac{7}{8}$  inches.

This recommendation, subject to the approval of all interests will become effective, January 1, 1931. It was also recommended by the general conference that a standing committee of the industry be appointed and vested with the responsibility of observing the adequacy of this recommendation throughout its active career. The membership of this committee is to be composed of three members each, from the International Association of Ice Cream Manufacturers, and the Dairy and Ice Cream Machinery and Supplies Association.

A summary report of the general conference, together with an acceptance form, is being sent to all concerned in the industry. When sufficient signed acceptances are received by the division of simplified practice, representative of at least 80 per cent of the

industry, based on annual production of cartons and molds, this recommendation will be printed as a part of the "Elimination of Waste" series of the Department of Commerce.

### **DRUG AND PHARMACEUTICAL BOTTLES**

#### **Survey to be Conducted to Ascertain Production Figures for Varieties of Bottles**

At the request of a joint simplified practice committee, representing the industries concerned, the division of simplified practice has prepared a questionnaire for mailing to the manufacturers of bottles. The purpose of such action is to ascertain the production volume of the various sizes, shapes, capacities, etc., of drug and pharmaceutical bottles.

The survey will cover the year 1929, and the figures furnished by each manufacturer will be included in a consolidated report showing the total production on each size, capacity, and shape of bottle used for prescription ware and those used for general purposes, respectively. The consolidated report will be studied by the joint committee with the view of developing a recommendation for the consideration of a general conference of all interests, held under the auspices of the division of simplified practice.

### **INFLATED RUBBER TOY BALLS**

#### **Industry Proposes to Eliminate Excessive Variety in Sizes**

Manufacturers of rubber balls convened in New York early in December to consider the application of simplified practice to this commodity. The meeting was held in conjunction with the annual meeting of the Toy Manufacturers of the U. S. A. Discussion of the problem confronting the manufacturers of toy balls disclosed the fact that the industry was suffering from excess variety in sizes of balls and that a simplification program could be adopted with benefit to all concerned.

A simplified-practice committee of the manufacturers was appointed to collect the necessary facts upon which to base a program, and a date for a conference was set. The division of simplified report will make a detailed report on this proposal in the next issue of the magazine.

### **GROUND-GLASS JOINTS**

#### **Conference Adopts Commercial Standard for Interchangeable Ground-Glass Joints for Laboratory Glassware**

On December 17 a group of representative manufacturers and users of laboratory glassware met at the Bureau of Standards under the auspices of the division of trade standards to establish a commercial standard for interchangeable ground-glass joints.

The need for such interchangeable joints has long existed, and to meet this need several manufacturers engaged in the business, each, however, using his own standard for taper and diameters. To obviate the confusion that such a condition would ultimately bring about, the several manufacturers gathered at preliminary meetings and proposed one standard



specification for taper and diameter sizes so that all manufacturers could make their interchangeable joints to this standard. Their activity culminated in the general conference held on December 17, 1929.

With several minor changes the proposed commercial standard was unanimously approved by the conference and recommended as the standard for the industry.

Upon general acceptance by the industry, this standard will be published by the Bureau of Standards and will become the basis for everyday trade in interchangeable joints, which will be marked S. T., indicating standard taper, and also with the manufacturers' or distributors' trade-mark and the diameter.

These interchangeable joints will facilitate the setting up of complicated pieces of laboratory apparatus and will provide for quick substitution of broken parts effecting vast economies over the older method of having to replace the entire apparatus.

### BRICK INDUSTRY TOLD OF MASONRY OPENING SIZES

Upon invitation, a representative of the division of simplified practice recently met with the board of directors of the American Face Brick Association during their annual convention at Edgewater Park, Miss., and presented to that group the history of the project on masonry-opening sizes. The directors decided to appoint a committee to go into the matter of a possible change in the standard size of face brick in case such a step is essential to the success of the project. The conference appreciated the fact that, while the cost of such a change might be considerable, the savings effected through better masonry openings would more than offset any increased costs.

### STANDARD STEEL WINDOW SIZES UNDER CONSIDERATION

Upon invitation a representative of the division of simplified practice recently met with the manufacturers of steel windows in Washington relative to possible adoption of standard masonry-opening sizes on the part of their industry.

It was the opinion of the manufacturers present that standard opening sizes, based on a constant variation in height and width, would be of material benefit to their industry, and they offered their support in the development of a specific program.

### STANDARDIZATION OF GOGGLES

#### German Industries Seek to Standardize Goggles with Respect to Sizes and Shapes of Goggles

According to the American Assistant Trade Commissioner, A. Douglas Cook, at Berlin, Germany, the German Standards' Association has requested all manufacturers, dealers, and the principal users of goggles in Germany to cooperate with the association in the standardization of goggles. The present standardization project is devoted to the selection of the types

of goggles best suited, the sizes of the glasses, the shape, and the proper colors. Due to the great diversification in the types of protective goggles now manufactured in Germany, very few manufacturers are able to realize sufficient profits from this branch of their business.

### LAMP STANDARDIZATION

#### Beneficial Effect of Standardizing Lamps in England Reviewed by London Hardwareman; Lower Prices and Better-Made Product Resulted

The beneficial effects of the standardization of lamps, which have been so evident in the United States for some time, are now being reflected in the British press. The Hardwareman, of London, points out that with the simplified lines of lamps introduced less than a year ago there has come an entirely new fashion in lamps. "The Pearl lamp, with its softly diffused lighting, thanks to standardization, is now cheaper than most clear lamps, and since it gives an infinitely better light, free from all glare and dazzle, it is destined to perform something of a miracle in the near future.

"This is none other than the total eclipse of the clear lamp that has remained supreme for upwards of 50 years. The recent reduction in the prices affords a striking example of the benefits accruing from standardization, and only became possible because a large proportion of the demand for general lighting service lamps of 15, 25, 40, 60, and 100 watts was and remains diverted to the pearl simplified line.

"By limiting business to this simplified line of lamps, dealers are not only assured of simplified stocks, a minimum investment, and a faster turnover, but are able now to offer the best lamps at prices below those of other general lighting service types. Thus standardization, so long desired by the manufacturer to reduce manufacturing costs, also produces practical benefits to the trade and user alike, since it gives users better and cheaper lamps than ever before."

### REPORT REVIEWS INDUSTRIAL RESEARCH

#### New Zealand Commission Includes Section on Rationalization and Scientific and Industrial Research in Annual Report

Included as part of the twelfth annual report of the Department of Industries and Commerce of New Zealand (1929) are two chapters that should prove of interest to the readers of the COMMERCIAL STANDARDS MONTHLY. These cover rationalization of industry and scientific and industrial research.

"Rationalization is an attempt to reorganize industry on rational lines," states this report, noting that "this involves cooperation by firms within an industry, elimination of waste, amplification, and standardization." While "rationalization of industry is not," the report points out, "a panacea for all existing evils, to this development is attributed the recovery of German industry. Wherever it has been applied, whether in Germany or elsewhere, it has met with a degree of success that promises well for the future."

Under the second discussion, that of scientific and industrial research, the report states that "during



the recent annual conference of the manufacturers of New Zealand a proposal to establish a standards laboratory was warmly commended, and a scheme for the extension of scientific assistance to manufacturing industries was also mentioned and supported. The importance, too, of early consideration being given to the questions of providing standard specifications, simplification of manufacturing processes, and standardization is under discussion with interested parties."

### NEED FOR TEXTILE STANDARDIZATION

#### English Mill Manager Explains Vital Need for Standardization in Textile Mills; Would Simplify Manufacturing Processes

An English mill manager's desire for standardization is voiced in a letter which was published by the Manchester Guardian. Because it bears on a situation which has its counterpart in the United States, the letter is given in full:

The Lancashire Cotton Corporation have stated in the press and in speeches that one of the objects of the corporation would be standardization of qualities and counts in particular mills. One wonders if the investing public, not engaged in trying to run a cotton mill under present conditions, realizes what this particular point means.

Take a concrete case at my own mill. We have 92,000 spindles, and our average count is 24's. To keep the mill running at present we have four qualities, with a range of 6's to 26's twist and 12's to 34's weft, and on our present lines the production is 78,000 pounds per week, with a wage and expense cost of 3.51d. per pound. If the mill were placed on one quality, say 24's weft and 18's twist, the production would be 95,000 pounds per week. The plant is easily capable of turning out this weight. The wages bill and expenses would be proportionately increased, say, 50 pounds sterling per week, and the cost of production would be 3d. per pound, saving 0.51d. per pound. The average count would change from 24's to 22.50, making a market difference in selling of 0.093d., reducing the savings to 0.416d. per pound, or 164 pounds sterling per week, or 8,200 pounds sterling per year. This, I know, would be an ideal state to attain, and my object is to show the possibility of saving on these lines, which would apply in varying degrees to all mills joining the corporation.

In addition to this the manager's bugbear of constantly changing preparation from one quality to another, which entail changes in the mule room in breaking out from one quality to another, and turning strings, with the lamentable loss of production, and extra actual cost in payment to operatives would be eliminated. One can only say, "Hurry up, corporation, and let the trade work on sane and sensible lines."

One must realize that the present system of a mill being a separate unit is a hopeless proposition, and the only solution is combination. This is only one specific instance of saving, but in my opinion the opportunities for reducing costs through a combine are innumerable and fairly easy to carry into practice with the resultant opportunity for Lancashire to be in the "forefront" once again as the producer of the world's cotton goods.

### LETTER-PAPER STANDARDS

#### Chamber of Commerce of Birmingham, England, Recommends Standard Sizes for Letter Paper

A report recently received from American Consul Harry Campbell, Birmingham, England, states that the Birmingham Chamber of Commerce has appointed a special committee to consider the question of standardization of commercial stationery. It was prompted to take this action in view of the progress made by the United States and Germany along this line.

A reduction of the wide variety of sizes of paper in use in England appeared to be of highest importance to the committee at its first meeting. The committee believes that it should be possible to draw up three main sizes of letter paper, which would meet the requirements of at least 90 per cent of the commercial letterheads. Three sizes, 15 by 8 inches, 10 by 8 inches, and 6½ by 8 inches, are considered to be the most suitable from the user's standpoint. Paper makers and printing establishments may suggest a slight change in these sizes, states the report of Consul Campbell.

The advantages of three standard sizes to the paper manufacturers, the printers, and the stationers would be decidedly great. The committee believes, however, that progress will be realized more rapidly and satisfactorily if the first initiative came from the trade organizations concerned.

### CRYSTALS CONTROL RADIO

#### Performance Requirements of Crystal Plates to Standardize Radio-Frequency

Standardization of practices and procedure among manufacturers of quartz crystal oscillators, which serve to eliminate interference by controlling the frequency of radio waves emitted from transmitters, were agreed upon at a conference, under the auspices of the Navy, attended by more than 50 representatives of various radio-manufacturing companies and interested governmental departments.

"The results obtained," according to the Navy Department, "were highly satisfactory to the Navy, and it is believed the way is paved for constructive steps leading toward a still higher degree of accuracy and precision in maintaining the frequency of radio waves emitted by naval radio equipment ashore and afloat."

The conference, of technical nature, was held recently at the invitation of the Bureau of Engineering of the Navy Department. The representatives in attendance were, besides manufacturers, engineers of communication companies and physicists.

Recommendations made by the conference, it is stated, include the adoption of standard terminology with reference to various phases of crystal manufacture to facilitate understanding and eliminate confusion, adoption of standard sizes and shapes for plates used for transmitter control, and adoption of general specifications outlining performance requirements of plates.

### SPECIFICATIONS FOR MATERIALS USED IN CLEANING

#### American Hospital Association Issues Folder Containing Information on Purchase of Operating and Maintenance Supplies for Buildings

The following material taken from an information folder provided by the hospital library and service bureau of the American Hospital Association is of interest to those concerned with the purchase of operating and maintenance supplies for buildings on a specification basis. The material is condensed from a report of the committee on cleaning (Dr. C. W. Mun-



ger, Port Chester, N. Y., chairman) to the administrative section of the American Hospital Association.

Referring to the subject of misbranding of cleaning preparations and the belief that advertisers' claims could not be relied upon, the committee conferred with the Bureau of Standards. It was agreed that the best means of saving hospitals from exploitation at the hands of dishonest manufacturers was the promotion of the wider use of specifications in the purchase of cleaning compounds. A number of specifications worked out by the American Hospital Association in cooperation with the Bureau of Standards were published in the 1924 report.

It is easy for large institutions with their own testing departments to check samples with the specifications. The growth of collective buying among hospitals would seem to make this also possible for smaller institutions which are members of hospital councils or similar buying organizations. Those not so fortunately situated could occasionally have recourse to a testing laboratory to check the products which they purchase.

There is included a list of Federal specifications available for hospital use, such as those for white floating soap, liquid soap, soap powder, salt-water soap, automobile soap, chip soap, bar and liquid laundry soap, grit cake soap, scouring compounds, hand grit soap, milled toilet soap, and powdered soap.

"In the 1924 report the statement was made that 'All abrasive powders must be readily soluble in water.' We believe this opinion to be essentially correct. Our idea in making the statement was that abrasive powders containing any palpable, insoluble material would injure such surfaces as glass, paint, etc.," states the report of the committee. "We have had occasion to test during the year, however, certain products containing insoluble abrasives, but these abrasives were in such extremely finely divided form that, after repeated tests, there appeared to be no injury to either paint or glass."

"We would like to say an additional word in connection with the waxing of floors, particularly linoleum. The committee last year recommended that the hospitals, where possible, make their own liquid floor wax from the solid wax, according to a formula which was submitted."

### FEDERAL SPECIFICATIONS OUT FOR COMMENT

**Fifteen Specifications, Including Eleven for Revision, Submitted for Comment and Criticism During November**

Last month the Federal Specifications Board submitted 4 new and 11 revised Federal specifications to all interested Government departments and establishments for any desired comment or criticism. Such comment and criticism will be turned over to the proper technical committee of the board for guidance in promulgating the specifications, which are as follows:

Paving brick; common concrete brick; couplings for 1½ and 2½ inch cotton rubber lined hose and 1½, 2, and 2½ inch unlined linen hose; couplings for oil and sand suction and discharge hose. Revised specifications are No. 261a, white cotton rags for wiping machinery (sterilized); No. 259a, colored cotton rags for wiping machinery (sterilized); No. 136a,

rubber-metal gasoline hose; No. 236, colon tube; No. 425, black carbon paper, lightweight, for typewriter use; No. 426, black carbon paper, standard weight, for typewriter use; No. 265a, black waterproof drawing ink; No. 501, plain velvet carpets; No. 502, Axminster rugs; No. 503, Wilton carpets and rugs; No. 416, ratchet braces; and resubmission of proposed specification for cloth, sensitized.

### STANDARDIZATION OF FREIGHT CARS

Greater standardization of freight cars, which reduces cost of repairs, was listed by R. H. Aishton, president of the American Railway Association, as one of the chief contributions to the more efficient operation of the railroads, in a recent address. He is quoted as saying: "To-day the railroad systems are one gigantic laboratory in which millions of persons are engaged in an extensive war on waste."

### A SCIENTIFICALLY ORGANIZED INDUSTRY

**Writer in "Net Results" Gives His Views on "What Constitutes a Scientifically Organized Industry"**

What would be your answer if some one asked you, "What is a scientifically organized industry?"

That is the question recently asked of H. A. Hopf, who gives his views in the magazine, *Net Results*, by stating that, "a scientifically organized industry is one in which the business is maintained on an economically sound basis so that the dangers attendant on defying any economic law will be avoided. Management is in the hands of individuals or groups who have a broad business and social perspective, seeing things from many angles rather than with a particular bias. The fundamental scheme of organization is simple and well integrated, with authorities and responsibilities clearly defined and carefully balanced. Industrial relations have advanced to the point where it is an accepted fact that the welfare of the worker is not only a responsibility of management but a condition of continuing success of the business."

"Plant planning and maintenance are governed by considerations of health and safety of the workers, as well as of effective performance of the work. Methods and procedures have been studied with a view to installing the one best way of performing each operation and of integrating all operations. Machines and equipment have been perfected to fit the requirements of the work and to conserve the health and strength of the workers. The various functions of the business are so coordinated and controlled that work will flow through the plant as evenly as possible and a full workday, work week and work year will be maintained. Workers are placed at jobs for which they are best fitted physically, mentally, and emotionally. Workers are trained in their jobs and given ample opportunity for development to fill jobs requiring increased skill and involving increased responsibility. Remuneration is based on value of work, skill in performance, responsibility involved, etc., and in all cases provides for at least a comfortable standard of living."

"Workers are given an opportunity to share in the prosperity of the business (not necessarily by means



of profit-sharing plans). Harmony is maintained between the management and the workers. An inspiring quality of leadership is shown from the top down through all the supervisory levels.

"We submit this definition," said Hopf in his article, "not by any means as our ultimate thought on the subject, but as embodying certain outstanding characteristics of a scientifically organized industry. We believe that any business which measurably meets the requirements set forth may well regard itself as entitled to the description, 'scientifically organized.' How many businesses that you know can qualify?"

## REDUCING COST OF PRODUCTION

**Research Frequently Causes Reduction in Manufacturing Costs; Iron Age Magazine Illustrates This with Examples**

"Manufacturing economies do not always fall in the category of higher speed of operation, fewer men for a given task, greater use of mechanical conveyors, less cross hauling of parts, and maximum use of automatic machinery," according to an account appearing in the magazine, *Iron Age*. "Frequently a change that appears insignificant cuts the cost of an important piece, and through much repetition in the production of that part, converts itself into a sizable sum on the right side. It may take the form of an engineering innovation or its bearing may be chiefly commercial.

"A single case will illustrate the point; automobile crank shafts have been forged from round steel bars cut to length and from square billets of equivalent cross section. It was thought in the engineering department of one plant that the round bars were necessary for best results, but tests showed this was not the case. Hence, the practice changed to the use of square billets, for two reasons. They were a bit cheaper to buy and were considerably less costly in freight charges, as they took the rate for semifinished steel. An added advantage was that they overcame the tendency occasionally noticed with the rounds of piling up in their progress down the gentle slope of the heating-furnace hearth.

"Here the commercial factor—reduced cost of delivered raw stock—and the practical or engineering consideration of less trouble in heating combined to suggest a change in shape. Not always is the advisability of a departure so clearly indicated.

"More frequently, perhaps, it is a case of striking a balance between prospective advantages from one source and disadvantages likely to result from some other condition involved in the proposed practice."

## PREVENTION OF FRAUD IN MAIL METERS

**Bureau of Standards Undertakes Study for Post Office Department Relative to Automatic Mailing Machines, in Which the Manufacturers Are Cooperating**

At the request of the Post Office Department the Bureau of Standards recently undertook an examination of mail meters to determine if these automatic vending machines could be "beaten."

The Post Office Department, in extending as far as possible the use of automatic and labor-saving ma-

chines in the Postal Service, has authorized the use of certain mail-metering devices. These permit persons who mail matter in comparatively large quantities, under certain conditions, to print for themselves the equivalent of postage stamps on their mail matter.

This avoids the necessity of purchasing and affixing the ordinary stamp, and at the same time effects material economies for the Government in the manufacture and canceling of stamps and in the handling of the mail. For this purpose there is attached to the user's mailing machine, a metering device, the function of which is to register every stamp impression made, to keep an accurate account of the total, and to prevent the making of any stamp impression without its being thus registered.

The mailer takes his mail meter to the post office, purchases a credit for a certain amount of postage, for which the meter is set and sealed, and then takes the meter with him, attaches it to his mailing machine and continues to print the stamp impressions on his mail until the credit established has been exhausted. The use of mailing meters is, of course, surrounded by numerous accounting safeguards to prevent fraud. The basic condition for the effectiveness of these safeguards is that the mail meters shall be "nonbeatable"; that is, that the user of the meter can not tamper with it so as to secure stamp impressions without their being registered by the meter, short of destroying the device.

### Vulnerable points in machine.

It has usually been the case, in the investigation of these devices by the Bureau of Standards, that, however, ingeniously and carefully they may have been thought out and constructed to adequately safeguard them against fraudulent use, an extended examination has revealed that there was some minor respect in which they were vulnerable and for which additional safeguards could be provided.

The manufacturers (it might be added) have co-operated effectively in these examinations and have been quick to incorporate any suggested changes which would afford additional safeguards or render those already provided still more effective.

## STANDARD COLORS FOR MACHINE TOOLS

**London Magazine Deplores Lack of Standardization of Machine Tool Colors in England; Uses American Progress as Example**

*Machinery*, London, editorially deplores the lack of standardized machine tool colors in England and points to the standardization of machine-tool colors being carried on in the United States as an example for English manufacturers.

"Users of machine tools will welcome a standard color as different builders are now using a variety," said the editorial, "and the average machine shop where equipment bought from many different manufacturers is used lacks uniformity. Some big motor-car companies and other larger users of machine tools have adopted standard colors of their own, and specify when purchasing that all machines be painted that color. This represents added expense and inconvenience to machine-tool builders, because they must paint their machines in different colors according to the



wishes of the purchasers. In future, when all machine tools are painted a standard color, as may well result from this action, there would be no object in specifying a special color to secure uniformity in large shops. The proposed arrangement of machine-tool builders in the United States will, it is hoped, be followed by makers at home; indeed, there is much in favor of a national color, in which case it will prove of advantage to both users and manufacturers of shop equipment."

The editorial refers to the standard for colors being prepared by the National Machine Tool Builders' Association. It is interesting to note in this connection that at the convention of the National Machine Tool Builders' Association in Cleveland, Ohio, recently, practically all machine tools exhibited were painted the standard gray color.

## BUSINESS RESEARCH REVIEWED

**Report Gives Complete Data on Established Research Agencies, Including List of Publications Issued and Projects in Progress**

Report No. 6, of the American Association of Collegiate Schools of Business Committee on Business Research, entitled "Research Projects of the Member Schools," has just been announced by the secretary of the committee, Dean William A. Rawles, of the School of Commerce and Finance, University of Indiana.

The committee on business research was created at the annual meeting of the association held in Columbus, Ohio, in May, 1925. At that time the committee's functions were stated to be "the assembling and dissemination of information regarding the research projects completed, in progress, and definitely planned by the research agencies represented in the association."

In this sixth report, the committee continues the practice of using the term "research agencies" to refer only to organized research agencies, such as bureaus and committees of business research. Two other practices, however, have been changed. The custom of issuing reports every six months has been abandoned, and the classification of projects has been simplified. The intention of the committee at present is to issue reports similar in form to this one, early in each calendar year, and in each report to give, for every established research agency: (1) The name of the agency, the date of its establishment, and the officers in charge at the date of reporting; (2) a list of all of the publications issued; and (3) a list of the projects in progress. In addition, each report will contain a list of the schools which are members of the association, and a subject index to the publications and projects listed.

## INDUSTRIAL GERMANY OF TO-DAY

**Rationalization Movement in Germany Explained by Doctor Bredt, of Berlin**

### Rationalization!

How much of the present European activity in rationalization is theory and how much is real accomplishment? In the November issue of *Factory and Industrial Management*, Dr. Otto Bredt, consult-

ing engineer, of Berlin, Germany, presents an authoritative and specific account in which he tells just what is aimed at, what has been done, and what still remains to be done.

In Germany, the term "rationalization," includes all problems of production, administration, and distribution. It means the organized effort to increase the total efficiency of human economic work and its factors, labor and capital, energy and material. Rationalization includes the standardization of raw materials and products; the simplification of methods in the actual work of production; and the interrelationship of producer and consumer.

While there is a great similarity between the German procedure of developing standardization and simplification programs and the American system, Doctor Bredt states that the German activities are handicapped by the traditional attitude toward shop secrets, which renders better results impossible. "Fortunately," he points out, "a marked change in this attitude is taking place as more German business men travel to America and see the advantages of the American point of view."

Anent the latter statement, many German business men, interested in the achievements of standardization and simplification activities in the United States, have from time to time visited the Bureau of Standards to consult with Ray M. Hudson, assistant director of the bureau in charge of commercial standards, and his staff for the purpose of learning at first hand of the procedure and results of these projects.

## ADHERENCE SURVEY ON STODDARD SOLVENT

**Survey of Stoddard Solvent Production for the First Eight Months of 1929 Shows 82.1 Per Cent Adherence to the Commercial Standard**

A survey to determine adherence to the commercial standard for Stoddard solvent for dry-cleaning purposes has just been completed to cover the first eight months of 1929. Twenty-nine refiners of petroleum products were circularized and replies were received from 13 producers of Stoddard solvent. Five reported 100 per cent of their production as conforming to the standard. The average of all percentages reported, not weighted according to individual production, was 82.1 per cent.

The chief cause of deviations from the standard was the demand for a more volatile solvent for home use and for dry-cleaning plants which do not possess adequate drying equipment.

All of the refiners who replied promote the sale of Stoddard solvent by instructions to their salesmen. In addition to this some advertise it in newspapers and magazines and in sales literature. Eleven are certifying the conformity of their product to the requirements and tests of the commercial standard.

Of the 13 replies only one stated definitely that his company had derived no benefit whatever from the establishment of the standard. Ten replied in the affirmative, five of whom added brief statements indicating why they considered it beneficial. No criticisms of importance were made and only one suggestion was offered; that the "main need of the industry



now is a lever, such as reduced insurance premiums or fire regulations, to make its adoption more universal."

The commercial standard for Stoddard solvent was developed in cooperation with the National Association of Dyers and Cleaners in an effort to produce a comparatively safe dry-cleaning solvent and reduce loss of life, property damage, and other fire hazards in the dry-cleaning industry. The flash point of this solvent is higher than that of gasoline, and other requirements are specified to insure its satisfactory use in dry-cleaning establishments. The standard became effective for new production on March 1, 1928.

In accordance with the recommendation of the standing committee, the commercial standard was reaffirmed without change for another year, beginning March 1, 1930.

## DENTAL BRUSH WHEELS

### General Conference of Industry Approves Proposed Simplification of Dental Brush Wheels

Manufacturers, distributors, and users of dental equipment, meeting in December, 1929, at the Edgewater Beach Hotel, in Chicago, Ill., approved a proposed simplified practice recommendation for dental brush wheels. The one session of the convention of the American Dental Trade Association that transpired under the auspices of the division of simplified practice recommended that brush wheels bearing the following numbers constitute the simplified list of sizes: Nos. 12, 20, 23, 25, 26, 27, 29, 30, 65, and 66.

This program has been in process of development for some time by the simplified-practice committee of the American Dental Trade Association. It is one of a series of similar programs in the dental line in the promulgation of which the association has sought the cooperative service of the division. A summary report of the conference and an acceptance blank have been mailed to all interests. Those readers of this magazine who have not received this data but who are desirous of becoming informed may secure information by addressing the division of simplified practice.

When signed acceptances have been received from those who are concerned with at least 80 per cent of the annual output of brush wheels this recommendation will be printed as a part of the "elimination of waste" series of the Department of Commerce.

## GLASS CONTAINERS

### Printed Booklet for Simplified-Practice Recommendation for Glass Containers Now Available

The printed booklet for Simplified Practice Recommendation No. R91-29, Glass Containers for Preserves, Jellies, and Apple Butter, is now available for purchase from the Superintendent of Documents, Government Printing Office, Washington, D. C., at a cost of 5 cents per copy, according to the division of simplified practice.

The booklet not only contains the recommendation in detail but also recounts the history of the development of the project. By the initiation of the program the varieties of sizes and dimensions of these articles were reduced as follows: Preserve jars, from 36 to 8;

jelly glasses, from 24 to 7; and apple-butter jars, from 6 to 4.

In the December issue of the *COMMERCIAL STANDARDS MONTHLY* there appeared an article by William E. Braithwaite, of the division of simplified practice, in which he reviewed the work done in connection with the promulgation of this particular recommendation.

## SIMPLIFICATION OF TRUNK SIZES PROPOSED

### Tentative Recommendation for Simplification of Trunk Sizes Prepared; Proposal to be Submitted to Industry for Comment

The members of the simplified-practice committee of the trunk, luggage, and leather-goods manufacturers of America have prepared a tentative recommendation for simplification of trunk sizes (including wardrobe, dress, steamer, and hand trunks), announces the division of simplified practice.

The organized effort was approved by the annual convention of the manufacturers on November 12 last. The division of simplified practice has been requested to submit the proposal to all manufacturers for comment and approval. In the event of approval the division will arrange for a general conference of all interests to discuss and adopt a final simplified-practice recommendation, establishing a simplified line of trunks, both as regards sizes and dimensions and nomenclature.

In the event this simplified-practice recommendation meets with the general approval of the trade it will be the next purpose of the same simplified-practice committee to prepare a companion proposal on the subject of hand luggage. This movement for the simplification of sizes for trunks and hand luggage has the support of the National Luggage Dealers' Association, the General Baggage Agents' Association, the National Retail Dry Goods' Association, the National Association of Retail Clothiers and Furnishers, and the Pullman Co.

## CASE-HARDENED STEEL

### New Method Studied by Bureau of Standards: Tests of Methods of Casehardening

In casehardening, one of the oldest metallurgical processes, the surface of soft—that is, low-carbon—steel is impregnated with carbon by heating at about 1,700° F. in charcoal, charred leather, or other carbonaceous material. The high-carbon layer at the surface may then be hardened by quenching in water from about 1,400° F., while the low-carbon interior remains soft during this treatment. Case-hardened steel thus has the very desirable properties of a hard exterior to resist wear and penetration and a soft and therefore tough interior which safeguards it against cracking.

Recently a new method of casehardening has been developed, called nitriding. In this method the hardness of the surface or case is conferred not by carbon but by nitrogen, ammonia gas being the source of nitrogen. The "nitrided case" is considerably harder than the "carburized case," but for some uses an



even greater advantage of the new process is that in nitriding the heating in ammonia is done at a much lower temperature, about 900° F., and that the article is hardened as a result of the heating in ammonia alone, no subsequent grinding being necessary. For these reasons articles do not warp during nitriding, as they often do in casehardening, and the expense of grinding and straightening is saved.

The Bureau of Standards has made a study of alloys of iron and nitrogen which helps to explain the new process. The usual methods of studying the different alloys formed between two elements were used. The structure of an alloy transforms upon heating, as, for instance, when an alloy begins to melt, so that a method called thermal analysis is used, in which the alloy is heated or cooled, and the temperature at which the transformations occur is noted. Another very important method is the microscopic examination of the different kinds of crystals of which the alloy is composed. By means of X rays the arrangement of the atoms in the crystal can also be determined.

It is not practicable to harden ordinary carbon steel with nitrogen on account of the insufficient hardness and brittleness of the surface layer in nitrided iron, and special alloy steels containing aluminum and sometimes molybdenum and chromium are used. However, before a study of the alloys of nitrogen with these complex alloy steels could be undertaken the simpler case of the alloys of nitrogen with pure iron had to be studied. Pure iron appears to form three definite compounds with nitrogen, containing, respectively, 4, 6, and 11 per cent nitrogen. The intermediate compound, containing 6 per cent nitrogen, appears to be the one to which the hardness of nitrided iron is due.

The Bureau of Standards work in this field is fully described in the *Journal of Research* published monthly by the bureau.

### PREVENTING CORROSION

**Simple Expedient to Prevent Corrosion of Open-Valley Flashings Developed by Bureau of Standards and Copper and Brass Research Association**

In certain localities, particularly New York City and its environs, some trouble has been experienced on account of corrosion of copper flashings. The corrosion occurs on open-valley flashings, usually on buildings with wood shingles, and results in a line of holes or cracks immediately under the overlying roofing.

Sixteen-ounce copper may, in some cases, be perforated in 15 to 20 years. Failures of copper-valley flashings are apparently of comparatively rare occurrence. However, copper is a material the use of which for roofing purposes is based on its well-recognized resistance to destructive atmospheric agencies. Hence, any factor which tends to limit the life of copper roofing even slightly is far more important than it would be for a cheaper material not selected primarily for long life.

Studies of failures and the results of laboratory tests at the Bureau of Standards in cooperation with the Copper and Brass Research Association showed that the corrosion is not primarily due to the action of the wood shingles. Under exceptional circum-

stances failures may occur even when no material other than copper itself is present. However, any porous and absorbent roofing, such as wood shingles, will hold water between the roofing and the flashing for a longer time after a rainfall than slate or similar nonporous materials, and, therefore, more rapid corrosion will result. It appears that flashings will be more likely to corrode in cities where the air is heavily contaminated with smoke and also carries considerable salt owing to proximity to the ocean.

Laboratory tests indicate that the following simple and inexpensive precaution will eliminate troubles due to line corrosion. The method is to place a strip of smoothly finished, hard, dense wood, preferably waterproofed, between the flashing and the roofing. The strip should be about the dimensions of a lath. It should be placed about 1 inch back from the edge of the roofing and nailed down tightly against the flashing.

Test specimens so made were unaffected by three times the exposure which caused line corrosion failure of specimens with the roofing laid directly over the flashing. It is reasonable to suppose that a similar difference will be found under actual service conditions. Therefore if the precaution is followed no appreciable line corrosion of flashings will occur after 50 years or more of service on a roof under conditions as severe as in New York City and its environs.

This investigation is fully described in the *Journal of Research* of the Bureau of Standards for December, 1929.

### SIZE OF TRAVELER'S CHECK REDUCED

Adoption of a modified American Express traveler's check, reduced to the approximate size of the new United States Government paper money, was authorized at a meeting in New York in October of the directors of the American Express Co., now affiliated with the Chase National Bank, according to newspaper items. The new check will be the exact size of the bank pocket check as recommended by the industry, through the division of simplified practice. More than \$2,000,000,000 of American Express travelers' checks have been circulated throughout the world since they were introduced as a medium of exchange 38 years ago according to these newspaper accounts.

### RECORDING STRESS STRAIN OF TEXTILES

**Method for Measuring the Stress-Strain Relations of Wet Textiles Developed by Bureau of Standards**

An immersion tank has been developed by the Bureau of Standards as auxiliary equipment for a recording stress-strain textile tester, so that conditions encountered during certain manufacturing and laundering operations can be reproduced.

This tank is built around the lower jaw of the testing machine. It is equipped with suitable stirrer, heater, and heat-control apparatus. The textile, in this method, is fastened in the jaws of the testing machine, liquid is poured in the tank, and after a suitable immersion period the break is made. The results of a series of tests on rayons broken dry, after wetting in water at 20° C. and at 100° C., and broken wet at various temperatures, are given in the *BUREAU OF STANDARDS JOURNAL OF RESEARCH*.



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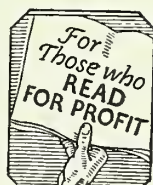
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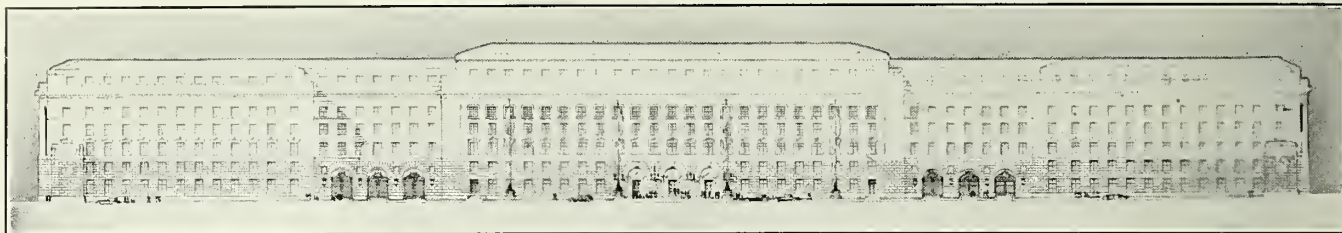
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—President Hoover, at the laying of the corner stone of the new building of the U. S. Department of Commerce, June 10, 1929.



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